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THE

CANADIAN NATIVE OIL;

ITS STORY, ITS USES, AND ITS PROFITS,

WITH SOME ACCOUNT OF

A VISIT TO THE OIL WELLS.

"———————————— many a row
Of starry lamps and blazing cressets, fed
With naphtha and asphaltus, yielded light
As from a sky." *Paradise Lost.*

LONDON:
ASHBY & CO., 79, KING WILLIAM STREET, E.C.
1862.

(ENTERED AT STATIONERS' HALL.)

CANADIAN NATIVE OIL.

ETC. ETC. ETC.

WHEN the probability of some disorderly escapade on the part of a certain "Rock, Mineral, or Native Oil," was brought before the Civic Magistrate a short time since, at the instigation of some respectable parties named "Paraffin" and "Sherwoodle," nearly related to the culprit, and said to be gravely interested in wishing to lock him up out of their way, his lordship having, it is to be presumed, taken the advice of the City Solicitor, and consulted Mr. Goodman, his own chief clerk,—declined to interfere. Very much to the surprise and disappointment of the tender relatives, the good uncle Paraffin and the cousin Sherwoodle, to the sad discomfiture of the aunt Belmontine and the great-aunt Camphine, as well as to the infinite disgust of Dr. Lancet, who volunteered his evidence on the occasion, as Analytical Commissioner (for the usual fee on either side), his lordship pronounced the young gentleman admissible to polite society, and capable of enlightening the world quite as well, if not better, than his more pretentious relations. Mr. William Cubitt, in fact, like a sensible man and a wise magistrate, declared that he thought the importation of the article ought not to be discouraged; "it was a new gift of Nature—an article of inestimable commercial advantage: and it seemed to him that every one ought gladly to avail himself of its production."

In this sage dictum, our worthy chief magistrate but vindicated in his own plain words, what a recent writer has observed in more glowing language, viz: "that among the innumerable inventions and improvements which characterize our times, we look back with absolute amazement at the slowness with which men of former generations turned to account the gifts of Nature. During many years they may almost be said not to have known what to do with anything. The materials of wealth were heaped about them on all sides, while they stood stolidly in the midst,

rather bewildered than benefited or enlightened by the prodigality of our Great Mother."*

Fifty years ago, when gas first came into general use, it was thought that the universal adoption of a means of lighting, at once so cheap, so brilliant, and so clean, would speedily reduce—in the first instance, the price of oil and tallow, and gradually lead to their almost total disuse. But it was not so; the prices both of tallow and oil rose to such a degree, what with the retirement of the great whales (over-hunted by a greedy commerce) to the more remote and inaccessible regions of their ocean homes, and the enormously increased demand for a lubricating medium for machinery—all of it the giant growth of the past half century,—that substitutes were eagerly sought after; hence Science at last, springing forward to the necessity, extracted from coal itself its hiddden treasures of light, stored from the sunbeams of many thousand years past, and handed it forth to craving mankind in the shape of coal oil. But this, which was the wonder of the last Great Exhibition, was, again, found to be comparatively too expensive for ordinary use, as well as fraught with another great disadvantage—the destruction of the coal itself in its distillation. Again the aid of Science was called in, and it was demanded of her that from sources yet unknown, and from materials otherwise useless, she should bring forth light and heat. She answered from the peat bog with paraffin; but here again the process was expensive. Again aroused, she pointed with exhausted hand to bituminous shale and other minerals, evidently but the incompleted representatives of the more perfect coal.

Under the names of Photogen, Paraffin Oil, Boghead or Bathgate naptha, a naptha has existed for several years in the commercial markets. It is now prepared on an immense scale in various parts of the New and Old World, as may be judged from the various specimens of the materials and the products to be seen everywhere in the International Exhibition. "It was, we believe, (says Mr. Robert Hunt in his new edition of Dr. Ure's Dictionary) at first procured solely by the distillation, at as low a temperature as possible, by the Torbarine mineral or Boghead coal of Scotland; but more recently it has been ascertained that any common coal, or every bituminous shale, if subjected to the same treatment, will yield similar products." Here again there was a process not expensive certainly, but still costly; and Science, having gained this step, advanced farther, as is her wont, *viz.*, from distillation to analysis, and a more complete utilization of products and residuum. "There is little doubt," says Mr. Charles Greville Williams, the able author of the "Handbook of Chemical Manufactures," in

* *Cornhill Magazine, June*, 1862.—Article: "What are our Oil-wells?"

observing upon some of these mineral products for supplying a cheaper light, "there is little doubt that a rigorous examination of the oils procurable by distillation of the various European and other bitumens, would be rewarded, not only by scientific results of great interest, but also by discoveries of immense commercial importance. It must not be forgotten in connection with the money value of such researches, that the bitumen yields a very high per centage of distillation, much greater than any of the shale or imperfectly fossilized coals, which are wrought on the large scale for the preparation of illuminating or lubricating oils."

The response was immediate to the suggestion, if indeed it had not already preceded it. The victorious progress of our arms in Burmah had opened up the products of that nation to our commerce, and one of the agents of Price's Candle Company, in their search after palm oils, came upon the famous tar or Petroleum Springs of Rangoon. Here he observed the naptha self-distilling at the wells, and forwarded some barrels of it to his principals; nor were they long before they availed themselves of this knowledge. This was the first introduction of Petroleum to commerce, and from this, by the aid of science, have resulted Belmontine, "a white transparent solid, a kind of paraffin, and the most elegant candle material known," our old friend the "naptha figuring under the title of paraffin oil—it being only paraffin oil, because the paraffin has been taken away from it—and "the extraordinary liquid named Sherwoodle," because we presume its ordinary scientific nomenclature of Benzole was not fine enough for it. An enormous profit had been the result of Mr. Young's Boghead coal or Torbane Patent oil; into this profit the Rangoon oil, Belmontine, and Sherwoodole worked their way, and cut out a large slice for themselves. In this pamphlet we are about to introduce to our English public the means of becoming sharers to a much larger extent in the same largely profitable transaction by a much cheaper and shorter road.

In the first place, however, we must premise a difference of opinion with the highest civic authority. Petroleum is *not* a "new gift of Nature." Its introduction to common use, and the chemical means for its more advantageous and cheaper utilisation are alone the novelty. With "native oil" the Persian has for ages lighted up his temple and his home, and roasted his mutton on coals of clay moistened with "native oil," the "naptha, or asphaltus" of Milton; the Red Indian has with it lighted his calumet of peace for centuries past; the Zantiote has lazily seen it run to waste ever, since his island was vomited upwards by a volcano from the sea; we brought it from the West Indies in asphaltum for our pavements; it abounds in the swamps of the Crimea; it floats unheeded on the Kuban; the Dyak of Borneo

collects it for his petty commerce; while those wonderful Chinese, who evidently must have known everything before any body else was born, have, for untold years boiled their salt pans and dissolved their rocks with it, at their Yen-tsing and Ho-tsing, their "salt wells and fire wells," which we hope our brave soldiers and our bold merchant explorers will not be long without an opportunity of seeing with their own eyes, in the Province of Setch-Ouen, on the banks of the great river Yantz-tse-Kiang, whose course extends from the Yellow Sea almost up to the confines of our outlying Indian provinces. The story of these Chinese Oil Wells is a curious one. The last European eyes that beheld them belonged to the Abbe Huc; but as he passed too rapidly through that portion of the country to make notes, the report he gives us is that of a martyr, now but just made a saint by the Pope, one M. Imbert, a French Roman Catholic missionary, who for many years had the charge of this district, and only left it to meet his martyrdom as Vicar Apostolic of Corea in 1838, a death tardily revenged by the late French expedition, but gloriously rewarded by his recent canonisation. In this report, after describing the country, and the method of boring wells by the Chinese (which is exactly that of the artesian principle in every point), and after telling us how a gas comes from these wells which the people lead off in pipes to burn under their salt pans, he goes on to say:—"When a salt well has been dug to the depth of 1000 feet—" (your Chinaman is never sparing of his labour or his patience)"—a bituminous oil is found in it that burns in water. Sometimes as many as four or five jars, of a hundred pounds each, are collected in a day. This oil is very fœtid, but it is made use of to light the sheds in which are the wells and cauldrons of salt. The Mandarins, by order of the Prince, sometimes buy thousands of jars of it in order to calcine rocks under water, and render the navigation less perilous. When a shipwreck takes place, the people make a kind of lamp of this oil, which they throw into the water near the spot, and then a diver (and oftener still a thief) goes down to search for any article of value that he can carry away, the subaqueous lamp lighting him perfectly."

We have thus native gas, native gas pipes, and "Native Oil" from the earliest period in China. The other places where it has been met with are Amiano (Duchy of Parma), Baku (on the Caspian), Barbadoes, Clermont (France), Gobian, near Besnieres (France) Galicia, Neufchâtel (Switzerland), Tegernsee (Bosnia), Trinidad, United States, Val di Noto (Sicily), Wallachia, Zante, St. Zelo (Modena).

But all these wondrous stores of long-treasured light lay useless until a lucky Yankee, in boring after a salt well, hit upon an oil-well of Nature's own distillation. It was the right thing in the right hands. He know how to use it, and, what is more,

Colonel Drake knew how to sell it. The story is curious, and not without its moral.

The Oil Springs of the United States.

The produce of the Oil Springs of the United States had been known in commerce for many years as "Seneca oil." The Indian tribes for ages held their councils and great festivals by the light produced from the fountains, at what is now known as "Oil Creek," a branch of the Alleghany river, in a wild and sterile tract of country in the north-western part of the State of of Pennsylvania. It was first collected for sale by the Seneca Indians, a tribe famous in the confederacy known as the "Six Nations," and which numbered among its chiefs the great orator Red Jacket, Big Tree, Farmer's Brother, and Corn Planter, all of them notable chiefs. They observed it floating on the banks of the stream, and collected it by spreading their blankets on the surface, and then wringing them out. The oil thus obtained they used as medicine, especially as an external application for rheumatism and affections of the joints. Hence its adoption, in the course of time, into the European pharmacopœias. But what once annointed the aching limbs of the savage and the early settlers, now lubricates the easy-going joints of steam-engines. Its fiery brightness no longer shines on the faces of the Red men, or glistens from a back ground of dark forests, but lights up in gay illumination the theatre or the promenade, and gives brilliancy to beauty in the ball-room or the *boudoir*. The oil was gathered and sold in small quantities for some years; but it was not until September, 1859, that Colonel Drake, of Titusville, while searching for a salt-spring, struck the first vein by boring at a depth of 70 feet. Since that time numerous wells have been sunk in that neighbourhood, and Titusville has become the centre of a busy mining district. Many remarkable stories are told of the reward of continued perseverance, on the part of men who have commenced the work of boring for the oil, which has been found at depths varying from 70 to 500 feet. One well, called the "Empire Well" will yield more than 7,000 gallons per day. More than five million gallons of oil have been raised and sold. The surface of the river is covered with that large portion which runs to waste. One poor man, rewarded for his labours with a "flow" of 100 gallons per minute, saw his wealth run away under his eyes, for he could not gather it. "The whole district is odorous with oil," says a journal of the locality, "the soil is made viscid by it. A piece of earth adheres to your boot, and you become at once odoriferous and offensive. Oil is every where; one "tastes it in the beer, and even whiskey fails to put it out. The flavour is detected in the bread; you eat bacon, but you taste oil. You

smell it and taste it in the air, and hold your nose to lessen its ungracious influence upon the olfactories. You go to bed, but the sheets are oily; you open a door, and your hand which has touched the handle has caught the contagion; you proceed to wash, and find a film upon the water, and as you wipe your face, the skin is imbued with an oleaginous deposit from the towel. Oildom asserts its sway, and Oil is King."

At Titusville, the oldest well, which we believe yielded Mr. Drake a handsome fortune, is now worked by the Seneca Oil Company, who obtain from it upwards of 500 gallons of pure oil per day. About a mile from this is a well worked by the firm of Crossley and Co., which yields an abundance of oil. A few rods below, Stackpole and Fletcher have found, in addition to a fine show of oil, a very strong salt well, which is a great acquisition to the country, as salt is a very scarce article. The next well of importance is the "Hibbard Well," which produces about 400 gallons of heavy oil per day. This oil is a better lubricator than the oil which is found in most of the wells. The next is the famous "M'Clintock Well," belonging to Brewer, Watson, and Co. The oil from this well, daily, is variously estimated from 1,000 to 1,200 gallons. The proprietors of this well have a large amount of oil territory, and are either boring, or have bored, some twelve wells on the choice points along the banks of Oil Creek. They have a quantity of oil lands on the Caldwell Creek, one of the tributaries of Oil Creek. The spring of Parker and Barnsdale is one of the best yet opened. It is said to yield 800 gallons daily. The oil is thin and fine, and loses but little in rectifying. There are many other wells in the neighbourhood of a less productive character, and many more nearly completed, which promise well for the future. At Tidionte, in Warren county, further up the Alleghany, seventeen wells are in operation, producing not less than 10,000 gallons per day. There are probably a hundred more wells being sunk at Tidionte. The Crescent Oil Company own a large tract of land near this place, and are producing great quantities of oil.

The Oil District is peculiar in many respects. The far famed Oil Creek is ordinarily a stream of about a hundred and three feet deep. It flows for seventeen miles in a southernly direction from Titusville to Oil City, where it falls into the Alleghany river. It resembles a huge eel wriggling through a narrow valley, about half a mile wide, with hills rising from seventy to a hundred feet high on each side, forming banks. The oil wells are bored in the level meadows or bottoms forming the dry links on each side of the creek, and they extend through the whole valley. From one well 20,000 gallons a day is now flowing. There is no evidence of the supply becoming exhausted, as the oldest flowing wells yield as abundantly to-day as when first

opened, and, excepting in a single instance the flow of none has been affected by new wells, sunk within a short distance. The boring of these wells is mostly executed by steam power, but the oil is not reached at a uniform depth, although it is generally obtained in the same sandstone strata. It seems to be contained in rocky channels and chambers. Our authority is the "Titusville Gazette," (all "Oil-Springs" have their newspaper) of the 20th March last.

Mecca, in the oil regions of Ohio, is situated in the north-eastern part of the State, fifty miles from Cleveland, and twenty-one miles from Erie. It is the most thriving town in the west. Within eight months of 1860, 250 new houses were built, and nearly one hundred acres of forest land have fallen before the advancing march of a battalion of "rail splitters." About two years ago, a gentleman interested in the Titusville mines, hearing that the water in the wells of this place was strongly impregnated with oil, came over and commenced drilling. At the depth of fifty feet he struck a vein of oil which proved to be the best lubricating oil yet found. Posting back to Pennsylvania, he formed a company and returned, leasing of the farmers some six hundred acres. The company then sub-leased the territory to parties for the purpose of boring for oils and minerals, requiring a a handsome bonus. The fame of the wells spread far and wide; faster and faster came up the pilgrims, until the pilgrimages to the modern Mecca bid fair to rival in numbers those made to the ancient one by the children of the Orient. They came not in caravans of large but of small companies, from all sections of the country; and, mingling in the crowd of miners, might be seen Cape Cod Yankees, the shrewd Connecticut ditto, Knickerbockers, Pennsylvanians, Hoosiers, Badgers, and Kentuckians—all ambitious of securing for themselves a paying oil-well. Nearly one hundred steam-engines are at work day time and night time, and in a moonlight evening to see the smoke and the steam and the fires of so many machines, within a comparatively small circumference, is truly a novel sight. The oil is used by nearly all the western railroads, also is being extensively refined in Cleveland, Columbus, and Cincinnati, and the business of supplying the refined oil and peculiar lamps required seems to be about the only one West now having life. As the railroads save themselves thousands of dollars per annum by its use, and the people are discarding the deadly camphine, and taking this oil instead, these mines are destined to give permanent employment and wealth to thousands.

The correspondent of the *Times* gives the following interesting description:—"The wells are mere holes in the ground, about six inches in diameter. They are dug by driving cast-iron pipes, four inches inside diameter, to the rock, varying in depth from

ten to sixty feet. After finding a 'good show' of oil, a pump is put in the well, driven by steam, and the oil and water pumped into large vats holding a hundred barrels each, the oil rising to the top while the water is drawn off at the bottom. The crude oil is sold readily at 2d. to 4d. sterling per gallon at the well, and the barrels paid for extra. It makes a better light when refined than any other burning fluid I have ever seen — second only to best coal gas, with no liability to explode, like many illuminating fluids that have been from time to time offered to the public. The phenomena produced upon opening some of these wells are very singular. One opened recently at Tidionte spouted the oil and water to the height of sixty feet, forced by the gas, the generation of which seems at all times to be going on. This new trade is worthy the attention of your oil dealers, and I hope will receive it. The supply seems inexhaustible. Wells that commenced pumping at the rate of 160 gallons per day, are now pumping six or seven times that amount, while a few, from which at their opening the oil was forced in large quantities by the pent up gas, have fallen off; but if the pump is stopped a few days (as has happened by the breakage of machinery), the oil commences to flow of its own accord. Most of the works are rude, and scarcely a well is worked to its capacity. Much of the oil territory is in the forest, the fuel for generating steam is green, and the whole thing is in its infancy. When a year shall have passed, and experience shall have taught owners and operators the true system to be pursued, the supply will be very much increased. The demand seems to augment with the supply. The refineries are not able to fulfil their orders, and it is scarcely used in the rural districts."

Fleets of flat boats have been built to run down the stream with the freshets. They are from 40 to 80 feet long and 2 feet deep. They are drawn up alongside the sides and run full by hose, then floated down to Pittsburgh where the oil is taken to the refineries, the expense of a barrel at 8s. being thus saved.

No one in that neighbourhood talks about explosion or its danger — that is left for the London Cockneys in Cornhill articles. They are careful of fire as all discreet men are likely to be in an oil store; but, there, in the very regionof oil, with hundreds of thousands of barrels lying about, and the oil floating on the surface of the river (which it has done for ages past, by the bye) no man would read without a 'guffaw' such passages as the following:—

"It is impossible to contemplate without uneasiness the imminent danger of such a state of things, for should any mischievous person apply a torch, a candle, or even a lighted cigar to the oily pellicle, the whole expanse of the Delaware would be instantly in a blaze, and all the ships on the river, and houses on the banks, would probably be consumed, since

water, instead of extinguishing the fire of Petroleum, only causes it to burn more fiercely."

Who cannot fancy this amusing writer treading gingerly through the City because gunpowder is stored at Purfleet and manufactured at Hounslow, or shivering at every steam-printers door lest the boiler should burst: or trembling in his shoes lest by smoking a cigar on the top of the Monument he might set fire to his kindred Thames? How terrible, too, are his prophetic visions of future accidents from stored Petroleum:

"A certain quantity of gas evolved from each barrel will meet in the atmosphere, and hang in a concentrated explosive cloud over the whole stock of petroleum. It will augment incessantly, and spread till it comes in contact with the nearest fire. An explosion will then take place, which will shatter and consume ships, docks, warehouses, with whatever else may be found within the range of its operation."

But why does not all this happen at Wyoming, in Canada, where 40,000 barrels lie stored in one railway shed?—an Oil City, where on the banks of the Alleghany 20,000 barrels all on a heap, like Messrs. Allsopps Pale Ale barrels on the Trent side at Burton, are waiting, in the open air, and unshaded from the sun, for freight to Pittsburgh? Why don't the open cisterns, there, with 30,000 barrels of oil in each, explode? Why do not the gaseous vapours come together there and "blow up the Mayor and Aldermen?" Why is not the Alleghany on fire, and the Delaware, and the St. Clair River, and the Sydenham, and the Black Creek? How comes that in 1861 the Philadelphia and Erie Railway carried 134,927 barrels, as against 825 in 1859, and yet was not fired or blown up? How is it that the 3,000 teamsters of Titusville, and the 300 at Wyoming, who, day by day, for two years, have carried barrels of oil by the dozen, over rough roads have never been burnt? Why! on one day last year there were 120,000 barrels on the ground at one time, in one place, at Oil Creek; and there was no blow up—no gas collection! *Usque adeo* this cockneyism? How long is the gaping world to be led by great names to listen to such monstrous nonsense? A wealth far beyond that of all Princes, as the writer himself acknowledges, is poured forth by Nature daily from her bounteous stores. It requires no labour, merely industry and skilful contrivance, to collect and store it. What does our cockney critic? Does he thank Providence for such a kindly gift? Does he warm with enthusiasm at such a store of light, and warmth for the poor? Does he recognise the aggrandisement of commercial advantages about to accrue to this nation? or the increased comfort to the community? the development of the Colony? No! Blinded by the sudden influx of brilliant light he flies with bats-wings, in the face of Providence, disparages the Almighty's best gifts; declares, ex cathedrâ of Cornhill pages, that, in defiance of the great first command, "Light

shall *not* be "; turns up his nose at the "American or Canadian to be detected invariably" (save the mark!) "like a musk or civet cat," and endeavours to frighten us with the story, that every other light, than that of his own farthing candle will be the Guy Faux's lantern of a general conflagration and explosion. The danger of these oils was found in the lighter portions of them; the point was to find a use for these. That use was found some time since, and the alarms of the writer in the Magazine are a manifest anachronism as well as an absurdity. Fortunately a more practical and philosophical view was taken of the Mineral Oils, on their first introduction, as the following from a Trade Journal, of March 31st last, will prove—Even the smell, which so offended the delicate olfactory nerves of the polite critic, has, it will be seen, vanished before that "neat-handed" maiden, Science.

ON NEW APPLICATIONS OF THE MINERAL OILS.

The discovery of the apparently inexhaustible supply of mineral oils in Canada and the States of North America *can scarcely be over-rated in a commercial point of view;* it promises in a short time to effect a very important change in the commercial relations between ourselves and the Transatlantic nations. Already in some of the cities of North America has the use of gas been superseded by this cheaper means of obtaining artificial illumination.

The mineral oils obtained in the States differ from those procured by the destructive distillation of coal or the Boghead shale. Unlike the coal tar products, they do not contain any large proportion of benzole, and hence are not capable of being used as a source of the new dyes, *aniline*, *magenta*, etc. They appear to belong to a different series of hydrocarbons—related to the Eupion group. The more volatile liquids contained in these oils are like the benzole of the Paraffin series, so inflammable, that they render the oils dangerous for use in lamps; and, as there has been hitherto no useful or profitable application of these lighter portions made, there has always been a temptation to allow them to remain in the oils, rendering them too inflammable to be perfectly safe. *Hence the great problem is to devise some useful application of these lighter products.* This important problem is in a fair way of being solved, as several practical applications have been suggested. The most volatile liquids of this group have a specific gravity varying from 6·50 to 7·50; they evaporate readily when exposed to the air, and hence they offer very considerable advantages when used instead of turpentine in the preparation of lead paint. For this purpose they have been successfully employed in America, and are coming into use in this country.

Again, as they possess the power of dissolving resinous substances with great rapidity, they may be used instead of wood spirit, methylated or pure alcohol, for the preparation of many kinds of varnish; and as they also possess a power that these spirits do not, namely, that of dissolving indian rubber and gutta percha, they offered the means of making certain combinations of elastic gums and resins in the preparation of varnishes which offer many advantages in practice.

We have received two samples of the lighter spirits prepared for these purposes. They are sold under the commercial name of Mineral Turps, or turpentine; their present price may be stated to be about one-third less than that of the ordinary turps. Both are perfectly colourless. No.

1, which is the more volatile, possesses a slight naphtha-like odour, totally free from any nauseous character. It is so diffusive, that a large drop allowed to fall upon thin paper spreads out into a width of 2 inches, and in a room at a temperature of 55° Fah. evaporates perfectly in 12 minutes, leaving the paper without any perceptible stain. Its vapour rises so rapidly, and so inflammable, that at the temperature of 65° a small portion on a plate gives out a vapour that can be set on fire one inch above the surface of the liquid. This fluid promises to be a most valuable agent in the preparation of varnishes, as a substitute for spirit, but it must be used with a due regard to the inflammable character of its very diffusive and inflammable vapour.

No. 2 Mineral Turps of the same company is rather heavier; its specific gravity is 7·45; it is perfectly colourless, but its odour is less pleasant than that of No. 1. It is rapidly diffusive, when dropped on paper, and leaves the slightest perceptible stain after evaporation; is less volatile, although its vapour at 65° can be inflamed half an inch above the surface of the liquid. This liquid is manufactured as a substitute for turps, in the ordinary lead paint, for which purpose it appears particularly adapted. It is obvious that the removal of these more volatile and inflammable portions is a great advantage to the oils intended for illumination; and that, though so easily ignited, they may, with due precaution, be used as safely as turps or spirit for the purposes for which they are respectively adapted.

There is one use of these lighter oils which does not appear to have been suggested, but which is quite worthy of a very extensive trial, namely, their employment as a means of increasing the illuminating power of coal gas. If a stream of gas, of a low illuminating power, is passed through these liquids, it carries off so much of the vapour that its illuminating power is increased in a remarkable degree; hence they may be used in those contrivances termed naphthalizers — in which the gas passes over and through porous strata saturated with the mineral oil. In order that the lighter mineral oils may be extensively employed for these purposes, they must be fairly purified — an object which may be readily accomplished by distilling them with charcoal reagents, which are of low cost, and are effectual in removing the nauseous smell that distinguishes the crude and undistilled samples of many varieties.

Having thus disposed of the American Oil Springs and the dangers prophecied as attendant upon the use of their products in this country,—dangers the more remarkable from the fact, that 30 millions of people have been using these oils for two years to the extent of many millions of barrels, and that most of them are yet living—we will proceed to enquire into the further treasures which, an all bounteous Providence has specially placed at our own disposal, as Englishmen, if we have but the good sense to use them properly, and grasp the favourable opportunity with a bold and vigorous hand.

The Oil Wells of Canada West.

The CANADA NATIVE OIL, like the American Rock Oil, is no new discovery. In 1842 it was first spoken of among the settlers. In 1847 it was mentioned by Sir William Logan, in the Government Geological Survey of Canada West. In 1858 a Mr. Williams,

now, we believe, a judge of the county of Kent (Canada W.), happened to be digging a pit in the clay on his farm, when he observed some globules of oil bubbling out on the surface of the soil, and was induced to dig down deeper, until the oil oozed out upon him, and filled the hole. This was the commencement of the Enniskillen oil wells. A writer in the *Toronto Globe*, Sept. 7, 1861, gives the following description of these wells:—

"No. 27, Township of Enniskillen. Lot No. 18. Williams and Co.' proprietors. Well sunk 46 feet to rock; bore 100 feet in rock.—This well averages the large quantity of 60 barrels per day. A very great deal of oil has been taken from it. It has been in operation two years.

"No. 28, ditto. 44 feet to rock; 150 feet in rock.—Yield, 50 barrels per day.

"No. 29, Williams and Co., proprietors. Well sunk 42 feet to rock; bore, 100 feet in rock.—From it over 100 barrels a-day were taken for six days in succession. It still yields copiously. Near the top of the bore there is a crevice in the rock, through which the oil, if allowed to reach so high, escapes; where it goes to there is no telling."

The curious scenes at these Oil-Wells is thus described:—

"Upon Messrs. Williams' property are situated the 'gum beds.' The first is in Lot 16, Second Concession of Enniskillen, three-quarters of a mile south of the concession line. About five acres of land are covered with congealed oil, which, at some remote period, appears to have escaped from its subterranean reservoir. For the most part it is covered with grass and weeds, but in many places is entirely exposed. The second 'gum bed,' similar in appearance, is on Lot 18, in the First Concession, about half-a-mile south-east of that first mentioned. Upon the first bed the wells numbered 27 and 28 have been sunk. Upon the second, No. 29 well has been sunk. These wells are at a greater than the average depth. They are further south of the line than most. Several other wells are being sunk upon Messrs. Williams' property. In one a depth of 250 feet has been obtained. Oil has been repeatedly met with in these wells, but not in a sufficient quantity to pay. It will, probably, be found lower down. It is said that the best oil comes from the greatest depths. Oil found in the rock is more esteemed than that which forces its way into the surface well, the latter being much less free from impurities than the former. The oil veins are exceedingly capricious. The distance of the rock from the surface may be predicated with some certainty if experience be taken as a guide, but there is no certainty as to the depth at which the oil will be found. It may burst through the gravel before the rock is reached; it may delay its appearance until the persevering well-sinker has penetrated to a depth of 250 feet. In Pennsylvania some of the best wells there, which produce the finest quality and the largest quantity of oil, are 500 feet below the surface. When the vein is first struck in a surface well, the lumps of blue clay are brought up to the top soaked in the blood-coloured fluid. Then the oil digger is in all his glory. He complaisantly turns his quid in his mouth, gives his hands another shove down his breeches pockets, and with face bright with smiles, oil, and perspiration, ejaculates as an interrogation, 'Beautiful, aint it?' Now, unless you have some near prospect of getting a share of the profits, it is not beautiful, neither in smell nor in looks, but exactly the contrary. It will not do to say so, however. Beautiful!—Is it not worth 6 cents (2½d.) a gallon, with every prospect of being worth twice as much this time next year? What should make it beautiful if that will not? According to the same authority,

everything oily about the territory is beautiful. The nasty Black Creek—aptly named—as it winds its way slowly along its narrow channel, between banks covered with derricks, and vats, and well-charred stumps, piles of barrels filled with the unctuous liquid, mounds of sand and clay,—is beautiful in his eyes; because it smells of petroleum, to his nose. 'Oil springs' looks like a small edition of South Staffordshire, quite as dirty, and smelling a great deal worse. But there is this in its favour: a forty-eight or ninety-six hours' acquaintance with its odours, and the olfactory nerves become insensible to them. From all points of the compass the creaking of the treadle by which the drill is worked" (exactly as described by Father Imbert as being done by the Chinese at their fire-wells and salt-wells) "can be heard throughout the night. Every day brings its quota of wayworn muddy travellers, who with bundles on their backs have stumbled through the dirt, climbed the stumps, and waded the ditches on the Wyoming and Florence roads. Many of them come to get employment, and they are sure of it; others come with dollars in their pockets, and in a few days they have added others to the large number of wells already sunk. There can be no doubt that if a good market can be found for the oil, of which there appears every probability, Oil Springs is destined to go ahead very rapidly. In addition to the refineries already existing, a New York house entertains the idea of founding another. Mr. Southern, the largest proprietor of oil springs (150 acres, Lot No. 18, Second Concession), sent to this house a sample of the Enniskillen rock oil, and it is pronounced by them to be the best they ever saw. The farm clearings around this portion of Enniskillen are few. Woods, huge, dark and almost impenetrable, except by the aid of the axe, extend in every direction. But they are destined soon to give place to the homestead of the settler. Roads are now the only want; the nearest Great Western Railway Station is that of Bothwell."

John Shaw's Fortune.

There it a story told in the *Toronto Globe*, of February 5th, 1862, which as the well is alluded to in Sir W. Logan's Official Report in the "Descriptive Catalogue of the Economic Minerals of Canada," now at the International Exhibition, may, we think, serve as a useful illustration of the subject: it must be premised, however, that John Shaw's well is not shut up, as might be inferred from the Official Report, but simply "corked up" with a bag of seeds in the pipe to stop the oil flowing away; John Shaw choosing not to let his good fortune run to waste, but rather to abide that good time coming in the present summer, when the capitalists of England shall unite in a Company to send out ships and bring away across the sea the crude oil he can run out in almost any quantity, to be refined by them, and converted by English skill and science into products of value. The story is as follows:

"One of the elements of romance at all times, has been the sudden elevation of individuals from penury to wealth and social consideration. Having settled to our own satisfaction that romance is not dead, we plunge *in medias res*, that is to say, into a certain deep well near Victoria, on Lot 18, in the Second Concession of the Township of Enniskillen. In that well a certain John Shaw centred all his hopes and expectations for many long months. Painfully did he dig, painfully drill, painfully pump, expending first cash and then credit, and afterwards his own muscles, on a wearisome task. Not a sign of oil did he find His neighbours' wells

were overflowing; he alone had received no share of the petrolean stream. The middle of last January found him a ruined, hopeless man, jeered at by his neighbours, his pockets empty, his clothes in tatters—as our neighbours across the lines say—dead broke. Report says that on a certain day in January, he found himself unable to pursue his work—not to put too fine a point on it, his boots had utterly given out, and to enable him to paddle about in the wet and cold, a new pair were absolutely necessary. In fear and trembling, as we may suppose, John Shaw proceeded to the neighbouring store, and having no money, asked—sad necessity—for a pair of boots on credit. Report sayeth not whether the refusal was kindly administered, in the spirit of self-defence which traders must sometimes fall back upon, or whether it was with the purse-pride of the rich man looking down on his humble neighbour; but certain it is that the boots were refused to John Shaw, and he returned to his well a sadder man than he had left it, protesting that he would work no longer than that day, and if success did not crown his efforts, he would cast the mud of Enniskillen from his old boots, and depart to more congenial climes. Moodily he took up his drill, and sternly struck it into the rock. Hark! what is that? A sound of liquid from the depths below, his sing and gurgling as it escapes from its confinements of centuries. Does it cease? No, on it comes, growing in volume every moment. It fills th pipe, it fills the well; still it comes. Five minutes; ten minutes; in fifteen minutes it has reached the top of the well; it overflows; it fills a tank; it overflows that; vain are all attempts to check its career; resistless, it pours in a mighty tide down the declivity into Black Creek, and is borne away by the waters to the St. Clair and the Lakes. Who shall attempt to describe the feelings of John Shaw at that moment? We shall not, for we do not know how he showed them. The by-standers have not recorded whether he wept, or whether he took off his hat and shouted hooray! Anything might be excused at such a moment. We suspect that, like a philosophic Yankee, he went to work to 'save the ile.' But the report of the flowing well spread like wildfire through the settlement, and 'John Shaw's territory' became the centre of attraction. In the morning he had been 'Old Shaw;' if they had spelt his name with a P before it, they could not have described him more contemptuously. Now he was Mr. Shaw. Congratulations poured upon him; and as he stood there, all covered with oil and mud, up came the store-keeper who had refused him the boots. The man of trade appreciated 'the situation,' he bowed before the rising sun, or rather the flowing oil lamp, and almost embracing the dirty luminary, he said: 'My dear Mr. Shaw, isn't there anything in my store you want; if there is, just say so.' What a moment for Shaw! We shall not record his answer—it was far too forcible to be polite. The well was then flowing at a rate impossible to test with accuracy, but afterwards when the yield was controlled, it produced two barrels of forty gallons each in a minute and a half; which at one cent. and a quarter per gallon (the lowest rate at which the article has been sold), would produce 66 cents per minute, $39 per hour, $950 per twenty-four hours, and $296,524 per annum, throwing off the odd cents and not counting Sunday! Neither the illustrious but unknown authors of the Arabian Nights, nor even Alexander Dumas, drew from their or his imagination a more sudden transformation than this of John Shaw—in the morning a beggar, and in the afternoon able to satisfy every want to be reached by money."

"John Shaw's flowing well has given an immense impetus to the petroleum trade of Enniskillen. Not only will it produce a large quantity itself, but it is quite certain that it will not long remain the only one of its kind in the neighbourhood. These facts have exhibited in a very clear light some things very urgently needed in the oil region. If sufficient capital were engaged in conveying the petroleum to market, and sufficient

means of transport supplied at a reasonable rate by the Great Western Railway, John Shaw would certainly receive two or three cents a gallon for his oil, and probably much more, and would be a much heavier millionnaire than he now is. A large majority of the well-diggers are poor, and are unable to pay the expense of barrelling and conveyance to market, and the merchant has not yet stepped in to perform his legitimate functions as the medium of communication between the producer and the consumer. The well-diggers are willing to sell the immense quantity of oil they have in their vats very low, for most of them, besides being 'hard up,' are anxious to dig deeper, in order to strike the point where the oil flows upwards by natural pressure. A very little money at this moment, therefore, will buy a large quantity of oil. At present the chief road to market is that to the Wyoming station of the Great Western Railroad. The sleighing is good, and the price of hauling not high. On the Great Western, however, it is alleged that the rates are too high; that the Company charge $60 a car-load from Wyoming to Hamilton, while they send a car-load of lumber the same distance for $21. We need hardly say that the oil trade is likely to be of vast service to the Great Western, not only in the freight it supplies directly, but in the improvement of the country through which two of the parallel lines of the railway pass; and that the oil-men ought to be encouraged by the Company in every reasonable way."

Thus far, the *Toronto Globe*. Another correspondent obliges us with

A Visit from Dresden to the Enniskillen Oil Regions.

"Were, what our cousins across the line call, an "air-line road," constructed, the distance would not much exceed ten miles from Dresden to Victoria, the scene where the "big well" is daily attracting its numerous visitors. But our way was by Dawn mills, and along the seventh concession of the township of Dawn, a circuitous route. The heavens had been propitious by a liberal bestowment of about two feet of snow, so that the sleighing was in first-rate condition, and cheered by the many sleigh-bells, we went merrily along. As we entered the seventh line, we travelled through a long stretch of fine rolling land, with occasional homesteads and clearings interspersed with patches of the thick forest, in which were prominent the hickory, the maple, and the beech—the sure indication of superior land. But, at length, the face of the country declined, and we found men busily employed in laying *corduroy*" (timber and trees lopped and topped, and laid side by side to form a firm but very "rough and tumble," up and down, road, common in well wooded countries) "through the swamps and swails" (soft splashy places) "to prevent the unlucky traveller from being buried with his team in the mud and mire. Along these low lands, which here and there rose into a higher altitude, we travelled five or six miles without a human habitation; when, lo! on turning an angle some ten miles from the wells, a peculiar perfume came floating on the breeze, which

grew stronger to our nasal organs as we neared the extraordinary place towards which we were hastening. Soon a cooper's shop presented itself, large, substantial, and business-like, but made of logs; then a land office for the sale of town lots, or *one-acre* diggings; all of which, at the present time, can be bought on easy terms, as cash is, of all things, the most needed. Further on, a Refinery, new but in full operation, was seen; but instead of passing on to it, our way lay to the right, where a fine site for the future city was spread before us, on which there is already a fair sprinkling of houses, with three good hotels and as many good stores, besides numbers of both of smaller pretensions. Passing by the many wells on the right and left, we hastened to the great object of attraction—the *big spouting well*, belonging to Mr. Shaw. As we descended from the high land into the plots, our attention was called by the admonition "No smoking allowed here;" (a caution not unnecessary, as a stream of oil has more than once been set on fire, and there are not sufficient men about to carry out the Chinese method of subduing fire under similar circumstances, as mentioned by Father Imbert, who make a lake and empty it into the hole); "then we saw a heterogeneous mass, in which were men, women, children, sleighs, loading and unloading, barrels empty and barrels full, barrels clean from the cooperage, and barrels smeared from the well. Amid hundreds of spectators, some men were making bung-holes in the new barrels, and others engaged in filling them, and still others clearing the passage, with every variety of noise and vociferation, while the busily employed, and the wondering spectators, were standing from one to six inches in a black, greasy matter, the mere waste of this extraordinary well, which, in making its way to the creek, covered the surface of the ground for many rods around with the oily stream. In different places, this valuable but filthy-looking stuff was being carefully gathered up by the visitors, among whom was an aged negro, who was striving to fill the bottle in his left hand with an old shoe in his right hand, a hole in the shoe wasting as much as it gave, like the well itself. From the mouth of the well, where the oil is bubbling up in every direction, there is a perpendicular tube some sixteen feet high, four inches in diameter, but reduced to three-quarters of an inch by a stop-cock at the top, from which the oil is conducted into six or seven large tanks, two of which will hold five hundred barrels. In each of these tanks, there is a tap about four feet from the ground, whence, by means of a short hose or funnel, the barrels are filled, the bungs driven in and then rolled into the road to be carted away. An intelligent gentleman, in charge of the operations, informed me that were it possible to get barrels in sufficient quantities, they could supply 1500 barrels in twenty-four hours; and that, even now, after having diminished the size

of the tube from four inches to three quarters of an inch, they were filling upwards of 500 barrels daily. The waste cannot be calculated. All along Black Creek—it is said for nearly a mile—there is a foot of oil on the top of the ice, which parties are gathering up and selling for what it will fetch. There are already three or four Refineries in the village, and the best refined oil is selling at fifty cents per gallon. We counted nearly 200 wells, some of which were being worked and still others were being made. Large numbers of men were busily employed in digging, banking up, and boring, all eager to penetrate to the bowels of the earth for the hidden treasure. It struck us that this extraordinary well is a serious injury to the other proprietors of wells, as friend Shaw can certainly undersell and outsell them all. His yield is spontaneous and continuous; theirs is constrained and must be raised at the expense of horse or manual labour. But the great difficulty is *getting it to market.* Teaming it to the Wyoming station, is so slow a process, though it is done from this one place at the rate of 500 barrels per day. It is therefore in contemplation to send it through iron tubes to the river Sydenham, at Dresden, and this, it is said, the state of the country will permit. There is a descent of from fifteen to twenty feet from Victoria to Dresden; so that by means of a raised reservoir at the former place, it may be forced along to vessels ready to receive it at the latter place.

This correspondent, whose testimony is the more valuable to us in this country, as he is addressing himself to persons immediately in the vicinity of the oil-springs, concludes his amusing account with some observations worthy of note:—

"The oil," he says, "is rising in public estimation, not merely as an illuminator, for which, in many respects, it is superior to all others, but in its crude state, for a variety of useful purposes. Around the diggings, it is extolled as a specific for catarrh, coughs, rheumatism, and as a liniment for sprains and bruises."

(It is singular that in the hill countries of the north-west of India, a surveying party, sent by the British Government, found that coal was used by the natives for medicinal purposes, they being ignorant of any other purpose to which its was applicable.)

"We have used it as a disinfectant in small-pox and scarlet fever, and found it as useful as the chloride of lime. We may also add, that we have found the Canadian Native Oil a valuable as well as cheap substitute for linseed oil and spirits of turpentine, in white lead, and colours, with which it readily mixes, and especially in outside and rougher painting."

Boring for Oil.

In the Abbé Huc's travels, the report of Father Imbert tells how the Chinese bored the earth for their salt springs and fire springs on the Artesian principle, with a pipe, and iron rod, and

a treddle, which the men took by turns to work, and generally made 2 feet in the twelve hours. Just the same process may be seen going on at the oil springs about Black Creek and Enniskillen. The average price charged by contract is 8s. or $2 a foot for the first hundred feet; for the second 12s. a foot; for the third 16s A distance of from 3 to 4½ feet is generally made per day. Each 100 feet requires an additional man to work the drill, and after a depth of 300 feet has been reached, a steam-engine is generally employed. The way in which these wells are sunk is this:—A hole from 4½ to 5 feet in diameter is dug to the rock in the ordinary manner, the sides being cribbed up with timber to prevent them falling in. Hitherto square wells have been principally made, and by taking pieces of timber, and dove-tailing the ends, the well-sinkers have been able to make their cribs at little cost, and with very rough tools. But the erection of a saw mill near the Creek has made lumber cheap, and cribs are now being made in the shape of large tubs, but without either top or bottom, which being let down into the wells as the sinking progresses, effectually protect the sides. When the rock is reached, a hole, say 2½ or 3 inches in diameter is bored into it for a distance of perhaps a dozen feet. An iron pipe is then driven into the hole in the same manner as piles are driven into the earth. The drill is next introduced. The cutting portion is of steel, shaped like a common chisel, welded to a round bar of iron, nearly as large in diameter as the iron pipe into which it is placed, and generally weighing from 200 to 300 lbs. The drill is suspended by a short rope from a beam overhead. In order to continue the boring, it is neeessary to get a reciprocating motion, and the object has been attained in this way:—An upright post is erected by the side of each well. Across the top of this post is placed a tapering spar, the thin end of which just crosses the well, the thick end being fastened to some tree at a convenient distance, or if none such can be found, a weight is attached to the end; but more generally, care having been taken to select a spar heavy enough for the purpose, no additional weight is required. It is now evident, that if the end next the well be bent, the spar will right itself the moment the pressure is removed, and that the desired motion may thus be obtained. Accordingly, the rope attached to the drill is fastened at a distance of about three feet from the end of the pole. From the extreme end hang ropes with stirrups, into which the workmen place their feet, and by alternately pressing and removing the pressure, the drill is lifted a distance of six, eight, or ten inches, as the case may be. Day after day the workmen thus "treddle" until the oil is reached. When, after boring for a given time, the men think that so much rock has been loosened as to render it necessary to clear out the hole, the drill is wound up to the top by means of a windlass, and the sand pump lowered. This pump

is merely an iron tube with a valve opening inwards at the bottom. When let down into the bore, the valve is forced open by coming into contact with the pounded rock, which gets to the inside. As soon as it is raised the contents of the tube pressing on the valve close it, and so imprison themselves within. The sand-pump has to be used when going through soft rock, many times a day. Shells, corals, and small pieces of the strata are constantly brought to the surface, so that geologists can tell with accuracy the nature of the formations through which the drills pass. When a quick-sand is reached, it causes a great deal of trouble, as iron pipes have to be driven down the bore until it is passed to keep the hole clear. But such a misfortune seldom happens.

A Visit to the Oil Springs of Enniskillen.

As it is always important to procure, whenever possible, the testimony of eye-witnesses, or persons on the spot, we think ourselves fortunate in possessing a report of the visit made to the Oil Springs of Enniskillen, Petrolia, and Black Creek, by a distinguished party from Toronto.

On Monday morning, says the *Toronto Globe,* of the 13th March last—

A number of Toronto gentlemen, who had been invited to visit the Enniskillen oil wells, for purposes which shall shortly appear, started from this city by the Great Western Railway. The party consisted of the Mayor of Toronto, Mr. J. G. Bowes, Professor Hind, Mr. Rice Lewis, Mr. Alexander Manning, Mr. Thompson (late of the firm of Thompson, Keith, and Co.), Mr. Henry Duncan, Mr. George S. Mackay, and Dr. Clarke, of Yorkville. The journey upon the whole was as pleasant as can be expected at this time of the year. The snow being upon the ground, there was no dust to annoy the passengers, but then there were the hot stoves—an almost unbearable nuisance. Relays of men were at work all along the road repairing the track, keeping it clear of snow, and carefully examining into its condition. Wyoming was reached in safety soon after nine o'clock. As the train stopped, the doors were thrown open, and the conductor announced to the folks inside the cars, that the journey to the City of Grease had been accomplished. Travellers sometimes pass the stations at which they wish to stay; but no such mistake ever occurs at Wyoming. The odour arising from the oil prevents it. On the evening in question, the heavily laden air rushed into the heated cars, awoke the sleepers, and provoked expressions of disgust from all and sundry. Opposite to the railway station is the Anglo-American Hotel, the chief house of entertainment in the village. It is a large wooden building, divided into small bedrooms, closely packed with beds. A resolute effort was made by every individual connected with the party to get at least a bed to himself. The rooms were appropriated, the doors locked and the keys pocketed, but the landlord, a just and upright man, determined to deal with all alike, re-opened the doors with a pass-key, and proclaimed a policy of strict neutrality. His worship the Mayor exerted his eloquence in vain. His arguments were useless in the face of the fact, that if the beds were apportioned as he desired, the permanent boarders would be displaced, and that could not be, for, as the chambermaid declared, 'they were ile men, sir; nice men, sir,' and with a decided emphasis, '*rich* men, sir.' Who

could hope to compete with such a combination of qualities? The Mayor gave it up, resigned himself to the inevitable, and the remainder of the company followed his example. The announcement that supper was ready mollified the temper of all, and the eating of it restored good humour. Albeit, fancy almost created the belief that everything was permeated with petroleum. It was impossible to get rid of the odour. Closed doors were useless. If the pockets of every man had been full of leeks, the scent could not have been worse. Small was the amount of sleep the strangers got on Thursday night.

Wyoming.

The first hours of daylight on Friday morning were given to an examination of Wyoming. It has probably a population of 300, principally teamsters, who are employed in the conveyance of the oil from Black Creek. The village is in the midst of almost impenetrable woods. But little land has been cleared, and close behind the "shanties" which have been erected, the tall pines still rear their heads. A few Stores, well stocked with a miscellaneous assortment of goods, have been put up. After dark, they are brilliantly lighted up with native oil lamps, and so show off the coloured calicoes and gaudy waistcoats, imported for the especial benefit of the "ile men" and their wives, to far greater advantage than the tallow candles of old. The majority of the houses are built of rough pine boards, or of logs plastered with clay. The Great Western Railway have erected a large wooden station, with a store-house attached, and a shed 300 feet long, to which they intend to add another hundred feet in a short time. This shed is full of barrels of oil awaiting the orders of their owners. Close by it twenty-four round tanks, capable of holding 130 barrels each, and three square tanks, capable of holding 600 barrels each, have been built, and are nearly all full. The well-owners have adopted this expedient to save expense, it being far cheaper to store the oil in large tanks, than to pay $2 for 40-gallon barrels. Altogether, there are about 10,500 barrels of oil at Wyoming awaiting shipment. Two thousand barrels were sent away in January, and 1000 in February. Nearly 40,000 barrels have been disposed of since the trade was opened.

The Journey to Black Creek.

Some excellent sleighing with bad horses brought the party to Black Creek. Everywhere along the road they met teamsters conveying barrels of oil at the rate of a cent per gallon. Seven and a half barrels make a tun, and each cart carried from 12 to 20 barrels of 40 gallons each; so that the teamster would not have made a bad day of it. The plank-road was in course of construction, though not yet completed. A steam saw-mill has been erected a little north of Black Creek, and sufficient lumber has been sawn to plank the road, with the exception of

three miles at the Wyoming end, which have been gravelled. Over two miles of planking were laid in the fall, and lumber for the remainder is distributed along the sides of the road, ready to be put down directly the snow disappears, so that the inconvenience of bad roads will be remedied in a very short time. (The *Oil Springs Gazette,* has since announced that the road is now completed).

On the way to Black Creek many "shanties" have been erected since last summer, and portions of the forest cleared; but the road is a very dreary one at present, and has few attractions except to speculators in oil. The dark woods close it in on either side, the huge trees stripped of their leaves by the winter, show scarcely any signs of life, while still clinging to their trunks are the withered remnants of the luxurious, but rank vegetation of former years. Large numbers of trees which have been felled by the axe, torn up by the wind, or which have fallen from decay, lie strewed about in all directions, adding nothing to the beauty of the landscape.

Petrolia.

About six miles south of Wyoming is Petrolia, an oil village of some importance, but whose glories are dim in the presence of those of Black Creek. A good number of wells have been sunk, but none are yielding very largely.

Mr. Coman's Well.

A Mr. T. Coman has got to a depth of 355 feet. He struck, at 55 feet below the surface, a hard limestone rock, which he penetrated a distance of about 30 feet. Next there came what the diggers call soapstone for 200 feet, then hard limestone again for 40 feet, since which time he has met with nothing but sand. Mr. Coman employs a steam engine of about six-horse power for drilling and pumping. He gets buts little oil—not more than two barrels per day, but he is determined to persevere.

Mr. Wheelwright's Well.

A short distance from Mr. Coman's well is one belonging to Mr. Wheelwright. He has penetrated the earth to a distance of 335 feet. When about 290 feet from the surface there was a great emission of gas, and a considerable quantity of oil was forced through the pipe far above the heads of the men employed in drilling. Gas continues to escape at intervals, and there appears at all times, judging from the seething sound, to be great trouble brewing at the bottom.

Adams'. Refinery.

Before leaving Petrolia, the party visited the refinery of Messrs. Adams. It is very complete, and the oil made therein is of the

best quality. But here as elsewhere there is a very great deal of waste. No use is made of the benzole which is allowed to escape, and the refuse oil finds its way into the creek. A black substance, very much like coal, accumulates in the stills, and is burned in one or more of the stoves of the establishment. Professor Hind suggested that the refuse oil should be mixed with saw dust and clay, and used as fuel, for which purpose it would beyond all doubt answer most admirably. Wood is so easily procured at Petrolia, that perhaps of the two it is the least expensive, but it might be shipped elsewhere to advantage, being less bulky than other fuel. [On the 21st of April, we hear that information had reached London (Canada West) of the advent of a spouting well on the Bligh Farm. Late on Tuesday evening, a strong and continuous stream spouted from a depth of 350 feet. The position of Petrolia, with roads at all times good, and only five miles from Wyoming station, renders this the more valuable. All the oil-well owners immediately betook themselves to deep boring.]

Black Creek.

Leaving Petrolia, the Toronto visitors made the best of their way to Black Creek. The village is progressing very fast; houses are springing up on all sides, and the Stores of late have largely increased in number. In a short time, the place will lose its rough and temporary look, and settle down into a staid and sober member of the municipal community. Not a few of the well-owners have brought their families with them, and there promises to be in a short time a fair proportion of the softer sex in the village. Immediate proximity to the wells is not a desirable position for a private house; and some of the oil-men who can afford it, have therefore purchased land to the west of the Wyoming road, where as yet the odorous liquid has not been found. Bye-and-bye it is to be expected they will erect buildings for themselves, and so constitute a "fashionable" quarter to the town. Black Creek does not yet know the luxury of side walks, and is by this time, there is little doubt, in a state of unmitigated mud. A movement is on foot to plank the road which runs through the oil-wells; and necessity will, in all probability, compel the early execution of the project. Land in the neighbourhood of Black Creek is rising in value; and as it is very fertile and well timbered, no long time can elapse before some large clearings for agricultural purposes will be made.

Examination of the Wells.—The Third Spouter.

As there was no time to be lost, the party started at once to examine the wells. They were first conducted to one owned by Messrs. Murdoch and M'Caul, upon "territory" belonging to

Mr. Bush, close upon the line between lots 17 and 18, in the second concession of Enniskillen. This is the third of the so-called flowing wells which have been discovered in Canada. Out of the ordinary wells, it should be understood the oil has to be pumped; but in the flowing wells it is forced to the surface without the aid of machinery. The men in the employ of Messrs. Murdoch and M'Caul had left off drilling on the 4th instant, and had gone to supper. Before doing so, gas had escaped through the bore, but they thought little of it. One of them, however, having forgotten some article of clothing, returned to the well at about seven o'clock P.M., and was astonished to find oil flowing out of the bore, at the rate of about five and twenty barrels per hour. The total depth of the well is 234 feet, and the pipe through which the oil now runs is 18 feet above the ground, so that it is forced upwards a distance of no less than 252 feet. The pressure necessary to effect this must be enormous. Since the vein was opened, the average rate at which it has yielded has not diminished.

An immense quantity of oil has been allowed to run into the creek. Inasmuch as it would cost about $1,200 a day to barrel all the oil flowing from this single well, the proprietors feel they have a little more than they know well what to do with. They have erected a large tank close by the well, which holds 350 barrels; and have partially plugged the pipe, but do not care to stop the flow altogether, as it is feared, that if the oil were not allowed its present mode of egress, it would find some other channel and disappear in the earth. This appears rather a chimerical fear, but it is said to be warranted by experience in Pennsylvania. The character of the strata through which the drill was passed in sinking the well is the same as that generally met with in this locality. The rock was found at a depth of 45 feet.

The pipe let into the mouth of these flowing wells is fixed in its position by having a bag of flax seed tied round the lower end, and, as the seed expands when it becomes damp, the pipe is very securely held.

Shaw's Flowing Well.

On the west half of lot 18, and but a short distance from Murdoch and M'Caul's well, is the flowing well owned by Mr. Shaw (before described.)

The second flowing oil-well belongs to Messrs. Bradley Brothers. It will run about 2,000 barrels in twenty-four hours. The rock was found at a distance of 52 feet below the surface. Oil was "struck" at a distance of 206 feet In this well an iron pipe has been driven down to a depth of 180 feet. In boring, the drill passed through 100 feet of soft soapstone, then 15 or 20

feet of hard rock, then through a piece of soapstone, and finally penetrated 2½ feet into a hard rock, when the appearance of the oil rendered further progress unnecessary.

The Other Wells.

These are all the flowing wells yet discovered, but there is no reason to be given why many more should not be found. Although they have placed the ordinary sort of which so much was before thought altogether in the shade, yet these latter have merits of their own sufficient to give them great importance, as the total of their yield must be immense. Messrs. Watkins and Mills possess a well now giving about thirty barrels per day. The oil forces its way up the bore through the rock, and has been suffered nearly to fill the well proper. The superincumbent pressure prevents the oil coming up as fast as it would do were the well kept empty. But the proprietors have already got more oil than they know what to do with, and so are glad to restrict the yield. They have nine tanks full, holding about 2,200 barrels, and a tenth tank is in course of construction. Besides which, they have filled two wells near by, which they are using as tanks until they need the oil for the market. On Mr. Bush's land are, among others, two wells which deserve notice. The first belongs to Nash and Co. The rock is fifty feet below the surface. The oil was found 85 feet farther down. The second belongs to Messrs. Buchanan and Gray. The rock is also 50 feet below the surface, but oil was not reached until it had been pierced a depth of 135 feet. The two wells are not more than eighty or ninety feet apart.

Surface Wells.

Sometime ago the surface wells, or wells into which the oil entered through the crevices in the rock, rendering boring unnecessary, were esteemed valuable, but they are now at a very considerable discount. Some of them have "given out," and their owners are engaged in drilling.

How Canadian Native Oil is refined.

The simple process of refining the oils is thus described by the *Scientific American.*

"Of the many uses to which Petroleum and its derivatives are applied, that of illuminating is the most important; and the process of refining is exceedingly simple. The crude material is put into a large iron retort connected with a sort of iron pipes, surrounded by cold water called the condenser. Heat is applied to the retort, and from the open extremity of the condenser a light coloured liquid of a strong odour soon flows. This is naphtha, and is very volatile and very explosive. Some refiners mix it with the burning-oil, and numerous accidents have resulted from such mercenary indiscretion which, however, can never be the case in oil sent

out under the hands of a respectable company, where every success depends on gaining and preserving a good name, and consequently a preference for their staple article in the world's markets. It is usually, however, run into a separate tank. After the naphtha has passed over, the oil used for illumination distils off. Steam is now forced into the retort and the heavy lubricating oil driven over. There now remains a black, oily, tarry matter—sometimes used to grease heavy machinery—and a black coke employed as fuel. There are, however, five substances separated in this operation, but only the first three are of any economic importance.

"The naphtha is used as a substitute for turpentine in paints, or by repeated distillation the benzole is separated from the fabrics. This, however, is rather a drug in the hands of the refiner.

"The burning-oil as it comes from the retort is of a yellow colour; in order to remove this, it is placed in a large lead-lined cistern, wherein it is agitated with about 10 per cent. of sulphuric acid. After the acid and the impurities have subsided, the oil is drawn off into another tank and agitated into 4 per cent. of soda lye. This last operation is to remove any acid remaining with the oil, and also to extract the residue of the coloring matter. In fact it is sometimes employed alone, and a very good oil obtained. The oil is now agitated with water to remove the soda lye, and is then ready for consumption."

One thing our readers may make sure of—pure Petroleum, Rock or carbon oil, when properly refined, is not and cannot be explosive. "Paraffine necessarily," says Dr. Hartley, Professor of Medical Jurisprudence at University College, in a report laid before the jury on a recent trial, "does not at ordinary temperatures give off vapour which will form an explosive mixture with atmospheric air. A lighted match may be applied to it without setting it on fire; its qualities, in this respect, being those of the ordinary animal oils used for lamps." It is only when 'tricks of trade' have been played off by the admixture of materials of an explosive character at a lower rate of temperature that such accidents (so called) can possibly occur.*

The wealth of the oil region of Canada would seem to be inexhaustible.

Theory of the Oil Wells.

This oil production is certainly an extraordinary natural phenomenon. Geologists and men of science, so-called, have not failed to indulge in their usual jargon and their multitudinous nomenclature on the subject; but, as yet, they have failed to account in any satisfactory manner for its existence, or to pro-

* The *Toronto Globe* has some sensible observations on this point. "The danger attending the use of well rectified petroleum," it says, "is as small as that attending the use of any other oil. The public to a very great extent have the remedy in their own hands. None but imperfectly rectified mineral or coal oil will explode. To test it let the buyer pour a little into a saucer, and gradually bring a piece of lighted paper or a match close to the surface of the fluid. If not properly rectified, the gas arising from the oil will ignite and produce a very slight explosion. Such oil must not be carried home."

mulgate any theory as to the quantity of oil which the underlying cavernous strata may contain. Whether it be an animal, vegetable or mineral productis still a question; whether coal in an incipient state, or coal deoxidated, or the product of coral rocks, or the separation of bitumen from coal, or oil "from somewhere or of some sort" forced into the limestone which is said to produce it, and a specimen of which is to be seen in the Canadian Court, at the International Exhibition, all seem to be equally doubtful and disputable and disputed. The only person who appears at all decided on any point, is Sir William Logan, and he speaks of its position as "*anticlinal*," with which, we presume, the unlearned ought to be satisfied. We give the Report from the "Geological Survey of Canada;" as quoted in the "Descriptive Catalogue of a Collection of the Economic Minerals of Canada and of its Crystalline Rocks," sent to the London International Exhibition, for 1862":—

Petroleum or Rock Oil.

Enniskillen.—Gum or mineral tar from the surface; Crude oil from the well; Refined or burning oil; Lubricating or machinery oil.

Natural springs of oil have been known in several localities in Western Canada. Two of these are in the township of Enniskillen, in the southern part of which are two patches of an acre or more, covered with a layer of several inches of viscid mineral tar or asphaltum, which has resulted from the drying up of the petroleum of these springs. Wells sunk in their vicinity, to a depth of from forty to sixty feet, through the superficial clays, encounter a stratum of gravel, resting on the surface of the rock beneath, and often filled with oil; giving origin to what are called surface wells. On boring into the underlying soft fossiliferous shales and limestone, fissures are met with at various depths, from which rise abundant supplies of oil, often accompanied with inflammable gas, and with water, which is sometimes saline. These fissures, which also supply the surface wells, are apparently connected with the oil-bearing strata of the Coniferous limestone; which is from 200 to 300 feet below the surface, in Enniskillen. Within an area of about four square miles in the first three ranges of this township, there were supposed to be, in August, 1861, about seventy wells, yielding more or less oil. Of these, 40 were surface wells, that is, wells sunk from 40 to 60 feet, through the drift clay and gravel, to the rock beneath. Some of these latter, which had yielded but little oil, gave abundant supplies by boring into the rock. The oil-bearing fissures or veins, in adjacent wells, were met with at depths varying from 36 to 100, and even 150 feet from the surface of the rock. One of the most abundant occurred at 60 feet. In some few cases the oil from the borings rises above the surface of the ground, constituting what are called flowing wells.

It is not easy to know the amount of oil which these wells are capable of supplying; since from the great difficulty in getting it to market, arising from the want of good roads, few of the wells are regularly and continuously pumped. Some of those which were bored in July and August last, are said upon good authority, to have yielded from 400 to 500 barrels of oil, in a week or two after having been opened; but the reservoirs provided, being filled with oil, the pumping of the wells was suspended. Two bored wells, belonging to Mr. Williams, which were the only ones continuously wrought in August last, are said to have yielded

together, during some months, from 20 to 25 barrels (of 40 gallons each,) daily. About six miles to the northward, at Petrolia, on lots 13 and 14 of ranges 10 and 11 of the same township, 16 wells had been sunk last August; of which 12 were surface wells, and had yielded large quantities of oil. Several of these had been wrought for nearly twelve months, and were supposed in that time to have yielded 1,000 barrels. Other wells had recently been bored to a depth of nearly 200 feet, but yielded less oil than the surface wells. The wells of this region seem, thus far, to be less important than those in the southern part of the township. The oil from the deep or rock is somewhat lighter and more fluid than that from the superficial wells, which is very dark coloured and somewhat viscid. . . . Adjacent borings sometimes appear to be connected with the same oil-yielding fissure, and to affect each other's supply; in some cases air passes down one shaft when the other is pumped.—*Corniferous formation, Devonian.* . . . The facts observed with regard to the petroleum springs in Canada and the United States, would seem to show that they are always on the lines of anticlinals, along which the oil from its superior levity accumulates, and afterwards by the pressure of water, is raised to the surface through the natural fissures which generally occur upon anticlinals. The oil-bearing limestone underlies an area of 7,000 square miles in Western Canada. The limestone is of marine origin, and contains no organic remains but those of marine animals; so that we are led to conclude that these hydrocarbons have been derived from a peculiar decomposition of their tissues. These tissues, as is well known, differ but little from those of the plants, which in many more recent formations have given rise to bitumens. We may suppose that many soft gelatinous animals, and perhaps plants, whose traces have disappeared, may have contributed to form the petroleum of these coral beds.

The next paragraph, relating to the kindred product, is of some importance, as showing a specimen of the victories which CANADIAN NATIVE OIL is likely to achieve over other products, as soon as it meets them in the open market, unweighted by difficulties of transport:—

Bituminous shale.—Shale from the bed; Burning oil; Lubricating oil. The shale of Collingwood, on lot 28, range 3, yields, when distilled, from 3 to 4 per cent. of tarry oil, which by the usual process of rectification affords oil fit for illumination and lubrication. Works were erected by Messrs. Pollard and Macdonell, in October, 1859, consisting of 24 retorts, and capable of yielding about 200 gallons of oil daily, by the distillation of from 20 to 30 tons of shale. The available bed of shale is 7 feet in thickness, and the material was delivered broken for the retorts, at 20 cents. the ton. The cost of the crude oil was said to be 14 cents. the gallon, and for a while the works were carried on successfully, a ready market being found for the oils; but the works were repeatedly destroyed by fire, and the oils from this source coming in competition with petroleum from the oil wells of Enniskillen, the enterprise is for the present abandoned.—*Utica formation, Lower Silurian.*

MR. T. STERRY HUNT'S OPINION.

It is the opinion of Mr. T. Sterry Hunt, the chemist of the Geological Survey, that—

"The petroleum oil proceeds from the corniferous limestone. This limestone outcrops at Port Erie, and runs across the country to Lake Huron, by the way of Woodstock. It is overlaid in some parts of Lambton

and Kent by a thick bed of shale of the Hamilton Group, and there are some others of a higher formation in Lambton, near Lake Huron, called the Chemung and Portage Group, which is the base of the coal measures in Michigan, 3000 or 4000 feet below the coal there. All these formations in Canada have a dip to the south of from 17 to 25 feet in the mile, therefore, the further south you go, the deeper under the surface will the rock be found. The surface drift in Kent is something over 200 feet thick. Probably the petroleum is collected in basins from the breaking up of the rock, and consequently the boring for it must be accompanied with risk ; but there can be no doubt that oil will be found for miles around the present springs."

Another Opinion.

"An American writer," says the author of the article, "*What are the Oil Wells?*" in the *Cornhill Magazine*—

"After having examined the wells of Canada, Ohio, and Pennsylvania, has arrived at the conclusion that petroleum is not coal, but coal-oil, stored away, he says, in cells, forming in the aggregate immense reefs. As it was collected from the impure waters of the early ocean by minute coral polypes, it has been driven by heat and pressure into reservoirs and crevices, where man's ingenuity is discovering it day by day. I have, in my possession, many specimens of this fossil coral, with the oil plainly visible in the cells. This fact, however, which he deems conclusive, proves nothing, except that the fragments of coral in question had been long enough steeped in an oleaginous fluid to permit the finer particles to penetrate through the pores, and coop themselves in the interior cells."

With all deference to this author, we must say that the opinion from which he differs does actually prove a great deal, if the coral limestone be always found with petroleum, and petroleum be not found without it. Another argument of some force in its favour would be the fact of the petroleum being found only in the 7000 square miles indicated by Sir William Logan, which the oil-bearing limestone underlies. And this would render nugatory the writer's objection, that "no other circumstances seem to favour this hypothesis," as "throughout the Eastern and Pacific oceans, from the Maldive Atolls to the barrier reefs of New Caledonia, and the smaller groups on the Southern Pacific, we find no oil wells amid coral formations, though vast beds of this substance, some in a state of subsidence, others incessantly upheaving, while a third class, neither rising nor sinking, has been explored with the minutest attention by scientific observers." The same writer goes on to say, more fancifully, we think, than philosophically, "The discoveries in America will necessarily lead to the study of the way in which the great reservoirs of petroleum are distributed under the earth's surface. Hitherto it would appear that, although the substance be popularly denominated rock-oil, it is usually found in morasses, swamps, and peat-bogs, sometimes at a distance from luxuriant vegetation, but occasionally, as in Zante, closely neighboured by vines and other beautiful shrubs." The present condition of the surface is of little force in a geological argument, although the presence of the peat-bogs would surely tend to

favour the coal-like origin of petroleum. "There," the (writer is alluding to Zante) "the marsh is small, bordered on one side by a bank of shingle, which protects it from the sun, and surrounded on all sides by a semi-circular range of hills, clearly indicating that what is now a marsh was formerly the crater of a volcano. In Canada the oil is found by boring through a stiff clay from fifty to a hundred feet in depth, mingled confusedly with vast boulders and frequently of limestone torn from the under-lying rocks. The surface of the plain situated at no great distance from the lakes, is flat, swampy, and densely wooded, a description which appears to answer equally well to the aspect of the oil-districts in the United States, where, however, it is sometimes necessary to carry down the borings to a depth of 500 feet." (It will be observed that Sir William Logan has much the best of this argument.) "It may be conjectured that the true locality of the oil was situated in the lowest ranges of mountains, which may account for the prodigious force with which the petroleum, when an opening has been made for it, shoots up into the atmosphere. Water, it is well known, will always endeavour, when first emancipated from the earth, to rise to the level from which it originally flowed; and the specific gravity of the petroleum being considerably less than that of water, it may be expected to display a stronger tendency to attain the height of its original spring-head than the most buoyant and elastic fountain."

Mr. Pease's Opinion.

Much more philosophical, and, indeed, more exact are the observations of Mr. F. S. Pease, of Buffalo, in his Trade Circular for 1861.

"The wonder that is expressed generally in regard to the immense flow of these oils is produced rather by the result of the uses to which they are applied than otherwise. The scientific research and chemical application which have produced the results and uses to which they are applied are more to be wondered at than the vastness and almost inexplicable functions of the oil-deposits themselves, which have been known for years, but only recently developed and applied; nor are these deposits, of themselves, any more wonderful than mountains of salt, and alkali lakes, borax springs, or sulphur rocks—these results of ages and nature's continued changes leave us to wonder at their vastness and conjecture as to their origin, while each new development adds an additional surprise.

"The theories advanced in regard to the origin of the Petroleum and oil springs of Pensylvania and Canada are various. Many of these are refuted by the nature and composition of this substance itself. We are more than ever convinced that the most plausible theory is, that the oil is of vegetable origin, and that these oils are the result of nature's chemical operations in the transformation of wood to coal, the different specific quantities showing the different stages of decomposition and transformation. Immense pressure forces the oil into different seams and springs far away from any known indications, and often in high and level districts."

More concisely it has been stated, that "the geological position of the oil appears in all cases to be between the bituminous coal beds and above the anthracite. The probability is, that it is derived from the volcanic separation of the bituminous from the carbonaceous portion of the coal, that it drains off between the strata and follows the inclination of the coal measures until it reaches the surface in some denuded portion of the coal bed, and through artificial openings provided for it by borings."

Professor Chapman's Opinion.

Professor Chapman, of Toronto, remarked, at a meeting of the Canadian Institute, that it was perfectly clear petroleum could not be derived from vegetable matter. In the rocks where it occurred, there were found no traces of vegetable remains except a few fucoids or sea-weeds. Thus it would without difficulty be regarded as a secondary product derived from animal remains. Some corals were found in these rocks, but quite as many organic remains were found in other rocks, in which there was no trace of oil. He considered it more reasonable to suppose, that these oils were formed by some process of nature at great depths beneath the earth's crust, rather than to look upon them as secondary products, derived from the alteration of vegetable or animal matter.

A Summing Up.

The opinion of the majority of men of science agrees with that of men of practice, and it has been summed up by a high authority as follows:—"There can be no question if petroleum be the right name, that it assimilates with coal as coal oil—coal in some form—bottled light and heat," and light in a more intense form, since the light from it is so much more brilliant than that of coal that 1000 feet of Petroleum gas is more than equal to 2000 feet of coal gas. The investigations of Warren, De La Rue, and Hugo Müller "find the fluid to consist of two principal hydro-carbons; viz., the Benzole class and another, unacted upon by acids, and apparently consisting of the radicals and the alcohols."

But, taking the Canadian Native Oil to be a mineral oil, which, indeed, it would seem to be a mere scientific paradox to dispute, its general characteristics may be thus summed up.

That it is lighter than water in the proportion of 0·82 to 100, and will therefore float upon it.

That in its natural state it contains—

5 parts of asphalte
4 ,, gas and water
90 ,, crude oil, composed of liquid hydro-carbonates.

That these 90 parts of crude oil when analysed give—

7 parts of uncoloured naptha, containing Benzine
27 „ liquid hydro-carbonates, of a faint amber colour
15 „ „ „ „ deeper yellow colour
35 „ „ „ „ deep reddish yellow
2 „ thick oil, containing paraffin
3 „ gaseous hydro-carbonates and fine charcoal.

The light given out by this oil when rectified or purified is clear and steady, almost equal to gas in brilliancy, and with a flame, which, in an ordinary lamp, has an illuminating power equal to six common candles, and far more brilliant than sperm oil. Half a pint of it is sufficient for twelve hours in a common lamp, although it is usually burnt in lamps specially constructed, of which a number of varieties, that have been brought over to this country, may be seen at the warehouse of Mr. F. M. Strange, 15, Cannon Street West.

Means of Bringing to Market.

In what manner the Canadian Native Oil has been received by docks and railways, which will derive so large a benefit from its transport, can be judged from the facts, that the Victoria Docks have issued a scale of charges that are exceptionally heavy.

This over-weighting is a would-be prohibition of the importation of the oils, and is equivalent, in ignorance, to the movement fifty years ago, that would have stopped the use of gas as likely to blow up London. It shows, however, that an important point in the constitution of any Company for the punctual importation and refinement of these oils, must be the securing Docks of their own, with premises available for storage of the Canadian Native Oils. When any article of commerce is received, while new, with a prejudice, the prejudice must be respected at first, and it will gradually fall of itself.

The English people will ask themselves the question: "Shall that which is used all over the world—with which the Chinese have boiled their salt pans, the Persians lighted their temples and palaces, which the Javanese and Malay of the Indian Archipelago, the Dyak of Borneo, have had in daily use for ages; which in France, in Germany, and throughout the great Continent of America, is welcomed as a friend, or made a household servant—shall this "liquid light" not be used in England, because some chemical compounds in imitation of it have exploded? Whereas a sure test and an infallible preventive have been discovered; the one the pouring the oil in a saucer and applying a match above; the other never selling it under 130, which is the point where safety can be assured. The Company which is about to be formed

for importing and refining this CANADIAN NATIVE OIL, under the title of the CANADIAN NATIVE OIL COMPANY, announces, a fixed intention to act upon the advice of Professor Herapath, Dr. Hassall, and Dr. Harvey of King's College, and abide by that standard as a strict rule, thus totally getting rid of the explosion difficulty, and securing to all consumers of oil marked with their brand or trade mark, a guarantee against any possibility of danger.

The Directors of the neighbouring Railways, as well as those communicating with New York and Boston, besides enforcing an additional charge on Native Oils, carefully issued a notice to their detriment in the commercial markets of this country.

An intelligent writer in the *Observer*, of March 30th, in the present year, remarks:—

"The recent discovery of oil wells in Canada West appears destined to effect a vast revolution in several important branches of industry, and may yet prove a source of national wealth equal to the discovery of gold mines, and the danger of these oils may be obviated by an exceedingly simple and inexpensive process. The oil, as it comes from the well, is as thin as water, of a dirty reddish brown colour, and as inflammable as spirit gas. In this condition, and at ordinary temperatures, the oil will ignite if a light is brought within an inch of its surface. Many serious accidents have arisen from negligence near the wells. When purified, however (as it always is before being offered in the market) it loses this dangerous quality. The most extraordinary proof of this was afforded during a fire at Halifax. The firemen took from the step of a door a barrel of the petroleum, knocked out the head and dipped their firewood into it. During the whole night the barrel stood open — cinders, coal, and burning wood fell into it and were extinguished by the oil. We have seen several specimens of the crude and refined oil, and with a lighted match have readily ignited the one; but when a light was dipped into the other, it was instantly extinguished. There is, therefore, no ground for apprehension as to the use of this most remarkable natural production, provided ordinary precautions are taken." Speaking of the railways and the advantage to be derived by their shareholders, the same writer says:—"In old fashioned countries like this, the coal and the iron ores have to be extracted by the slow processes of the miners' pick, and raised to the surface by expensive machinery. Not so in the land of Oil Springs. There earth, the bounteous mother, herself fills the trains which are to distribute her gifts through every country, and all the resources of powerful companies are taxed to convey the oil with sufficient rapidity to gas-works and manufactories of all descriptions waiting for the supply. The price of the oil at the springs is about twopence per gallon; gas can be obtained from it at a cost of less than one-half at which it is obtained from coal; and when the railways have fully grappled with the task of its conveyance, the oil will not only prove a source of unfailing dividends to shareholders, but by the multiplicity of purposes to which it can be applied will effect most important changes in several of the industrial arts. An age that claims the lightning for its messenger may yet accomplish the feat of providing artificial light as cheaply as daylight, and a time may come when the residuum of petroleum will prove of vastly increased value to the arts and science of the day."

The writer spoke like a prophet; for the above was written

only in March, and now in June it has already been discovered, that the products of the residuum of petroleum, after the photogene is exhausted to a profit, bear in themselves a high commercial value as the base of our most precious dyes.

A writer in the June number of the *Cornhill Magazine* observes:—"Whatever other faults or shortcomings may be laid to our charge, we can hardly be accused of neglecting any source of material wealth. We have already discovered in petroleum a substance which will amalgamate with wax in the manufacture of candles, while from the benzoline, or quintessence of the oil, the fashionable dyes of rosenine and magenta are obtained. It has also been stated that petroleum likewise supplies a fine lubricating oil, though we trust none of our fair readers will imagine it is to be applied to the skin, it being intended for lubricating machinery."

The writer will possibly be surprised to learn that this oil is a specific for certain diseases of the skin, but must be used with care, as having a tendency to produce inflammation—an action in which mainly consists the *rationale* of the cure.

In regard to the question of danger, a leading article in *The Daily News* of March 10th, 1862, says:—"Mr. W. B. Tegetmeier, the editor of 'The Ironmonger,' a gentleman, whose scientific attainments have never been allowed to overlay his taste for what we may call domestic economy, has fortunately devoted much attention to this subject; he has examined every lamp ever made in modern times, and analysed all the mineral oils he could procure. The result of his investigations may be summed up in a very few words. With the most ordinary care there is no danger whatever in the use of paraffine or mineral oil 'lamps.' A good burning-oil should have all the lighter and more inflammable liquids removed by distillation (which of course is sure to be the case when these products become more profitable than the oil itself) and while it should be sufficiently limpid and volatile to ascend the wick to the flame it should not be so inflammable as to burn like camphine or spirits of wine without a wick. If the new rock oil fulfils these conditions, the nights of dear domestic lights are surely numbered."

It will be good news for our friends in Enniskillen, to learn that an association of capitalists in England has made the exportation of their staple product independent of Railways. The Canadian Canal system was most fortunately perfected by a wise and far-seeing government—not distracted by local prejudices and favoritism,—on a grand and catholic system. The vast interior of the Canadas, the wide regions of the Far West are opened over an area of thousands of miles by water communication. Hence it happened, that no sooner was this great discovery known in the commercial markets, than the readiest and most facile means of communication were immediately sought and found by the sea, by the great St. Lawrence, by the Welland Canal, by the Lakes, by the smaller rivers, by the tramway, and so into the centre of the Oil District.

The Township of Enniskillen is in the southernmost portion of the county of Lambton (a grateful remembrance of Canada's great benefactor, Lord Durham), in Canada West. It lies south of Lake Huron, and within a few miles of the banks of a small

river running into the Lake St. Clair, which communicates with Lake Erie, whence, by the Welland Canal, there is access by a continuous line of river and canal navigation to the mighty stream of the St. Lawrence, and so to the Atlantic Ocean, and the great ports of all the world.

The feeling entertained on the spot as to the necessity for the "oil men's" securing transport by sea is proved by the speeches at the meeting held at Black Creek, which was attended by the Mayor of Toronto, Mr. J. G. Bowes, Mr. Alexander Manning, Mr. Rice Lewis, Mr. Thompson (Thompson and Keith), Mr. Henry Duncan, Dr. Clarke (Yorkville), Mr. George S. Mackay, and Professor Hind, of Trinity College. From Sarnia came the Mayor, Mr. Adams, Hon. Mr. Cameron, H.L.C., Mr. Davis, Lambton County Attorney, Mr. A. Miller, Mr. Forsyth, Dr. Fisher, J.P., and Mr. Lee. The meeting was organised by calling Mr. Elliott, of Mount Elliot, to the chair, who stated that the object of the meeting was, that men of notability, men of means and influence, should see with their own eyes, that the oil was to be obtained in quantities as large as had been represented, and might be induced to advance the necessary capital to enable the possessors of this valuable natural product to turn it to the profitable account which their laborious experience entitled them to expect. The oil produced in Enniskillen was equal to at least 3000 barrels per day, and over the road between Black Creek and Wyoming from 140 to 150 teams passed every day.

The Mayor of Toronto, Mr. J. G. Bowes, said three things were requisite,—a lower rate of freight, readier access to market, and a ready sale for the article.

Now, in the first place, he (Mr. Bowes) thought that, without their co-operation, a proper market could not be established for the oil. The government of this Province, and the municipalities of this Province, had embarrassed themselves for the purpose of providing the products of Canada with means of access to the great markets of the world, so that it was only right the railway companies themselves should co-operate with the producers. The farmers complained, and reasonably complained, that they had contributed largely to the construction of the lines of railway, but they did not enjoy the advantage of cheap freight which was due to them. The "oil men" of Enniskillen made the same complaint. The only remedy for the difficulty was for them to combine, and by building a road of their own, render themselves independent of the railway. One man could not do this. If they united, it could most unquestionably be accomplished. (Cheers.) If they would allow him (Mr. Bowes) to suggest a basis for the combination, he would propose some such plan as this—that a company should be formed of capitalists and "oil men;" that the stock of the latter should consist of oil put in at the lowest cost price, which price should be paid to them by the company—the money being supplied by the capitalist portion of it—that the oil should be sent to Europe, and the profits derived from it should be divided *pro rata* among the stockholders. (Cheers.) He (Mr. Bowes) thought a capital of $100,000 would be sufficient for this purpose. Agents would be employed to sell the oil, and men acquainted with every branch of the forwarding business

would see that it reached its destination by the cheapest possible route. It was absolutely necessary there should be a medium between the producer and the consumer. The merchant was that medium. If the producers were obliged to go and negotiate for the transit of the article, and for its sale, he stepped out of his proper sphere, and was sure to lose money. The oil was now being produced with a rapidity of which they could not take advantage, because they lacked the means of carrying the oil to the market, where a profit could be made upon it. These means a company would be able to supply. His Worship concluded with some remarks upon the completeness with which every component part of the oil could be turned to advantage.

Mr. Campbell, of Black Creek, next spoke. He said he was one of the oil producers of Enniskillen. He understood the business, from the digging of of the well to the securing of oil ; not theoretically, but practically. This oil had been thrown upon the world at an extraordinary time, when men had been casting about for a quarter of a century to know what to burn ; and now God had cast this responsibility upon them. He wished to see the oil sold at such a price, that while it remunerated the oil-digger, the poorest child would be able to get a light to read by. (Cheers.) Speaking for the men of Enniskillen, he was sure they felt thankful for the suggestions which had been made. It proved to them that they were dealing with men of thorough and sound business capacity, whose advice they must follow if they were to have prosperity in this matter.

Mr. Alexander Manning, being called upon to speak, remarked that when, as it would appear, the whale fisheries were becoming inadequate to supply the wants of man, nature had provided a magnificent substitute in the oil wells of Enniskillen. The producers of the oil were principally men who had laboured hard and spent nearly every cent they had got. What they now wanted, was for capitalists to come forward, and bring the product of their industry before the world. The great consuming portion of the world knew nothing of the springs ; in fact, only those who had witnessed the producing power of the wells could realise their importance. By isolated, individual effort, the well-owners could not hope to place their oil in the best position on the market—that could only be done by the concentrated energies of a company. A tramway to some point on the river had been spoken of, and it had occurred to him (Mr. Manning) that if it were built, large tanks upon wheels might be constructed, and run to or near to each oil producer's land, and being there filled, might be run along the tramway to the port selected as the terminus of the road. If vessels were also built with tanks in them, the whole expense of barrels would be saved. When this was accomplished, there would be no difficulty in getting to the European markets.

Mr. Rice Lewis said the flowing wells surpassed anything he had ever dreamed of. (Cheers.) Like the Queen of Sheba, who visited Solomon, he was ready to declare that he had not believed the word which came, but his eyes had seen it, and the half had not been told him. (Cheers and laughter.) Now that this immense mine of natural wealth had been discovered, it only remained to make it available, so that the men who had laboured so hard, and persevered through so many difficulties would reap the reward so well merited by them. (Cheers.) To effect this. a company should be formed, and he fully concurred with che suggestions made by the Mayor to that end. In his (Mr. Lewis') opinion, it was the only way by which the wealth now running to waste could be saved. He regretted that more capitalists and mercantile men were not present, for then more would be convinced that there was a mine of wealth in Enniskillen equal to California, or British Columbia. (Cheers.)

Professor Hind said three questions had been brought forward before the meeting by previous speakers. The first related to the transportation

of the oil between the Oil Springs and foreign markets ; the second to the very wonderful production of the oil; the third to the foreign markets. With reference to the first, he need say very few words : with reference to the second, he never had conceived that such a wonderful flow of oil could take place. There seemed to be no geological reason to doubt its continuance for a very long period of time. But there was one circumstance all who visited the wells must have observed. There were now three so-called "flowing wells," whose products they were to a certain extent incapable of controlling, and large quantities of oil were running into the creek. There were at the present moment not less than a thousand men engaged in boring for the purpose of getting a fresh supply. He (Professor Hind) would suggest that operations should be suspended until a market had been found. Suppose half a dozen "flowing wells" were struck, oil would be lost unless a market were at once opened. As to whether a market could be found he would beg to call the attention of the meeting to a few facts. Few could form any idea of the extraordinary attention given of late years in England and on the continent of Europe, to find a cheap source of illumination and of heat. In England, coal might be bought at the mouth of the pit at six shillings a ton, and so well had the manufacture of gas been carried out, that the whole cost of its manufacture was covered by the price at which the coke was sold. But there were many districts that could not be reached by gas, and consequently a great portion of the population of Great Britain, not residing in towns, were looking out for some source of illumination as cheap as gas. They were searching every part of the world to discover that substance which had been hit upon in Enniskillen. One company had given £60,000 for some asphaltum lands in Cuba, and they had made a call for £100,000 to put their works in operation. The crude material was by this company taken home, and after the long voyage converted into the very material we had in Enniskillen in such abundance. Then there was the Burmese Naphtha Company. Ships 1,000 tons burthen had been provided with iron tanks, by which means this Burmese petroleum was carried a distance of 16,000 miles to England. Then there was the Torbarine mineral company, who made oil by the distillation of Boghead coal, and by which Mr. Young, the patentee, made £100.000, a-year. At a trial in London it was proved that one firm alone had constructed 374,000 lamps for burning this oil. Now the oil made from the Boghead coal was exactly the same as that discovered ready made at Black Creek. When we discovered it was the source of the new dyes, known as mauve, magenta, azurine, and rosaline, which had recently been discovered its importance was still more apparent. It was only within the last few months that a means of fixing these dyes upon fabrics had been discovered, and now they promised to supersede the importation of foreign dyes. Upon the continent multitudinous were the devices for cheapening fuel. He (Mr. Hind) had made the remark to-day that if saw-dust were plentiful in this neighbourhood, and if that saw-dust were mixed with the crude oil now flowing into the river, they would be doing what was now being done in France and Germany. There exist at least eight different patents for making fuel from crude tar, oil, and saw-dust mixed with a little clay. As a source of fuel, there was no doubt petroleum would find a great market in France. The Germans were searching every part of Europe for what they called "shale," which they distilled for the purpose of obtaining oil. Supposing the crude petroleum could be placed, as had been suggested by Mr. Manning, in iron tanks, and landed at Rouen, Havre, Hamburg, and other places, at two shillings a gallon, they would be introducing a substance richer than the celebrated Torbay mineral, which sold for three shillings at home—two shillings would give the well-owners of Enniskillen an enormous profit. (Cheers.)

Mr. Manning wished to say a word about the probable consumption

oil in Canada. Mr. Thompson had applied for a patent for making gas from coal oil, and if he succeeded as he had good reason to expect there was little doubt that in a short time the city of Toronto would be lit up with petrolcum gas. The gas obtained from the oil gave a far superior light to that obtained from coal. The gas used in the city cost 4 dollars per thousand feet, subject to a discount of 25 per cent. if paid within fifteen days after the payment fell due. Mr. Thompson said it could be produced from oil for one dollar per thousand, giving three times the light.

Mr. Forsyth read from a circular, issued by an English house, in which it was stated, that if the wells of Pennsylvania and Canada continued their yield, the export of rock oil would soon be as great as the export of cotton. Mr. Forsyth also read a letter he had received from a gentleman in England, who said he could dispose of ten thousand barrels of Canada oil per day at prices ranging from 15*l.* to 17*l.* sterling per ton.

Some conversation then ensued as to the resolution which had been proposed by Mr. Campbell.

In pursuance of the resolutions adopted at this important meeting, a tramway is in progress down to the water's edge, and the "oil men" are ready, as may be seen, to afford every co-operation to a Company formed for expediting the transit of their products to the markets of the world.

What is wanted is a Company with ample capital, say of £100,000, so that a dock, and premises for reception, storage, and the refining of oils on their arrival, may be engaged, and arrangements made for the purchase of ships (old colliers and the like, which may be had for moderate prices) to fetch over the oils without breaking bulk from the place of shipment to the London and other European ports. The profits of such a transaction must necessarily be enormous, as the Company will not limit its dealing to the sale of oils refined by itself alone, but will give opportunity to other persons to engage in the business of refining by supplying them with the crude oil. In England, Ireland, Scotland, Germany, Russia, and France there is a ready market.

"It is evident," says the *Toronto Globe*, of the 5th of February last "that while the first cost of the crude petroleum is so small, and the supply so great, cheapness of conveyance to market is a matter of the first importance, and that some more economical avenue must be found than the railway supplies. The natural outlet is there, but the organisation and some short communications are wanting. The south branch of Bears Creek is navigable for schooners as high as Dresden, which is about ten miles from Victoria. Wallaceburgh, at the junction of the north and south branches, is 12 miles from Victoria, and Wilkesport Landing on the north branch, also navigable for schooners, is 11½ miles from Victoria. It is possible, when the water is high, to float barrels down the north branch from the wells, and put them on board vessels at Wilkesport or Wallaceburgh, thence to be conveyed to any part of the Lakes, but during the greater part of the year the oil must be conveyed by ordinary roads. In winter, the existing roads are passable; in summer they are not so; *at Dresden, Wallaceburgh, or Wilkesport, a vessel may take in her load and not part with it until she reaches Liverpool or London Docks.*

Here it will be seen the cost of such transit to New York is set down as 400 per cent. upon the original value of the oil at the wells, and assuming the freight from New York to Liverpool, or London, to be 8s. per barrel, the price would be 750 per cent. on the original value of the wells, from which it results

A transit entirely by sea from port to port without transhipment would alone yield a large dividend on its capital to the Company. The CANADIAN NATIVE OIL COMPANY will have its own wells upon its own lands, while, at the same time, it will afford every facility to the "oil men" of the district. Mr. J. B. Williams, a magistrate of Kent County, Canada West, who, with Mr. W. H. Wells, a well-known judge of the same county, points out Dresden on the Sydenham river as the best seat for the Company's shipping operations, also adds that, "Judging from the increased quantities of oil spouting up wherever it has been struck, it cannot be doubted that the supply extends over a large space of the country; in fact, the same indications that were first met with in Enniskillen are now being discovered in the adjacent townships of Dawn, Brook, and Sombra." In the two last of these, as well as in Enniskillen, large tracts of land have been secured by the Company (4000 acres in the aggregate), equally well adapted for farming purposes, and well covered with the oak of which casks are made, while the low creeks, in which they abound in parts, shew every indication of oil. The Company have what is presumed must be a flowing well of their own; but this they will not open, reserving it until they have availed themselves of the immense quantities of oil not only waiting shipment, but absolutely running to waste from want of means of conveyance to a market.

RETURN CARGOES.

Curiously enough a return cargo of coals will be highly remunerative, as the anthracite coal of the United States is not available for many purposes for which the bituminous coal of the British Isles is absolutely necessary. Hence the disadvantage of all vessels in which CANADIAN NATIVE OIL is carried being thereby rendered unfit for any other trade will not in this instance militate against the Company's interests; nor will even the winter season interfere with the Company's operations, since, an arrangement may at any time be effected with the Grand Trunk and Great Western of Canada to carry oil in the more severe season during the close of the river navigation, to Portland, Bic, Port Levi, or even to New York, for shipment in the Company's vessels.

Products and Uses of Canadian Native Oil.

It is necessary, before going further, that we should elucidate the products and uses of the Canadian Native Oil. The practical applications of this abundant natural product are of a most important character. Its general introduction for many purposes of the arts is, unquestionably, only a matter of time, and the due establishment, in the minds of large consumers, of the conviction of a certain and unfailing supply. Dr. Sheridan Muspratt has given the following analysis of the products of Canadian Petroleum by destructive distillation.

100 parts of Enniskillen oil yield, on distillation :—

Light coloured naptha (S. G. ·794) - -	20
Heavy yellow naptha (S. G. ·837) - -	50
Lubricating oil, rich in paraffine - -	22
Tar - - - - - - -	5
Charcoal - - - - - - -	1
Loss - - - - - - -	2
	100

The specific gravity of the crude oil is ·835, being five beyond ·830, the standard of specific gravity required in England of the best petroleum.

The light coloured naptha is the Benzine of the manufacturer, which has all the qualities of Benzole, but is of a finer quality and colour.

Its use as an Oil for Lamps.

Cheap as petroleum is in Canada, there is no reason why, sooner or later, that cheapness may not be made to tell in this country ; for, at 2s. a gallon, it will be unquestionably the cheapest illuminator manufactured. Here, where acids and alkalies are at a low price and abundant, and where all the by-products can be sold with profit, in a ready market, the rectifying and purification of the Canadian Native Oil in a crude state can be carried on at such a rate, as to bring the price equal to that of Canada, and make up the difference of cost, tonnage, freight, and insurance. As a general illuminator, whenever oil is used, there can be little doubt that the low price of Canadian Native Oil, as well as the superior brilliancy of its light, will rapidly diffuse a demand for it throughout Great Britain and the Continent.

The cheapness of petroleum which has already arrested the production of coal oil in the United States, and as we learn by telegraph across the United States from St. Francisco has diminished greatly the number of American vessels engaged in the whaling

trade of the South Seas, will most probably have a similar effect on the manufacture of oils from bituminous shales, which has, of late, been practised on an extensive scale in France.

In Northern Germany, coal oils are very largely used for street illumination, on the railroads, and most exposed localities. They are largely manufactured in Hamburg; but if crude Canadian Native Oil were laid down in that city, at the cost at which it can be supplied from the Canada wells seaborne, by a Company having its own vessels (freight, insurance, and profit being added), the manufacture of coal oils would cease.

In Saxony and in Prussia, similar results would follow; a cheaper illuminator and a better, being in the field, the Bituminous-Shale-Oil Works, so common in these countries, would soon be abandoned; for it must be borne in mind that such manufactures yield but small profits, even with all the skill of the German and French practical chemists. It is of the utmost importance to notice that if crude Canadian Native Oil were imported it would not occasion any material change in machinery, for all the larger products which are the chief sources of profit, the Canadian Native Oil is capable of producing in common with coal. These products are—

1. NAPHTHA used as a solvent for caoutchouc, and different resins and gums.

2. BENZOLE, a valuable substitute for alcohol, ether, and turpentine; a preparation of it called benzoline dissolves India rubber and gutta percha (in consequence of which it has given opportunity for a variety of manufactures of elastic fibres, and has greatly advantaged the progress of electric telegraphs, submarine, and otherwise). Benzole dissolves fats, and is largely used in woollen, cotton, and silk manufactures; it restores faded colours; removes tar, paint, oils, grease, and resin, and possesses many other remarkable qualities. It is more generally known in trade as "Mineral Turps," having been largely substituted in the making of paints, as well as in other cases for turpentine, owing to the rise of price in the latter, owing to the war between the United States. There is also another use to which benzole may be applied—the making of a brilliant gas, at very trifling expense, with no difficulty, and with a most simple, compact, and accessible machinery. A stream of air driven through benzole becomes so inflammable as to serve for the purpose of illumination. In this mode of using the hydrocabon, it should be kept slightly warm to assist its evaporisation. A machine on this principle, of American invention, has been employed to illuminate houses. The air is driven through the benzole by a very simple contrivance, the motive power being a descending weight.

3. ILLUMINATING OIL, respecting which nothing further need be said.

4. Heavy Lubricating Oils; for which, when mixed with a certain proportion of other fatty materials, there is a great demand for machinery purposes throughout the world. The qualities required in oil for machinery use are that it should be free from acid reaction, not volatile, capable of withstanding both cold and heat, and able to lubricate without "gumming." These qualities are all possessed by the Canadian Native Oil, after distillation and refinement from the crude state. The Canadian Lubricating Oil stands both heat and cold without changing its consistency, and is in all respects equal to the best sperm which fetches 90*l.* a ton. This Canadian Lubricating Oil is equally superior for manufactures, steam engines, and manufacturing purposes generally, as it is for railroad purposes.

5. Naphtaline.

6. Tar. The source of Mauve, Magenta, Rosaline, Azurine, etc., which when mixed with a certain proportion of crude oil is used for the manufacture of gas, or when mixed with saw-dust, as stated hereafter, for fuel.

7. Refuse Carbon suitable also for fuel.

Gas from Canadian Native Oil.

"This is an established fact already," says the *Cornhill Magazine*, "the inhabitants of Montreal, and perhaps by this time other Canadian towns, are illuminated on their way home from the tavern, or playhouse, by Petroleum gas." An advertisement appeared, on December 12, in the Toronto papers, to the following effect:—

GAS FROM PETROLEUM.

I WOULD inform the Public that I have completed my experiment in making Gas from Crude Petroleum, and am now prepared to offer one of the most brilliant and economical Gas lights yet invented.

GAS CAN BE MADE

AT

ONE DOLLAR PER ONE THOUSAND FEET,

And can be seen burning on my premises.

I Am Manufacturing Portable Gas Works

To supply the Gas to Private and Public Buildings for $250 and upwards, and am now prepared to supply with promptness any demands made on me for them.

JAMES E. THOMSON,
109, King-street West, Toronto.

Toronto, Dec. 12. 3648 B.

On April 4, appeared the following—

CIRCULAR.

109, King Street West, Toronto, April 3, 1862.

SIR,—We beg to inform you that we have secured a patent in Canada fer the manufacture of Illuminating Gas from Crude Petroleum.

Our Process is susceptible of being applied on any scale—from the lighting of a Dwelling House to that of the largest City.

Three materials are employed in the manufacture of our Illuminating Gas. These are, Crude Petroleum, Water, and Charcoal or Coke, all of them accessible and cheap, and from the extraordinary abundance of Petroleum in Canada and the United States, this body is likely to remain so.

The qualities which we confidently expect will secure for Petroleum Gas your favour, are:—

1st.—Its extraordinary illuminating power.

2nd.—The mildness and softness of its light.

3rd.—Its cheapness.

4th.—The ease with which a supply can always be controlled for illuminating, heating, or cooking purposes.

A one-foot burner gives a flame as large as a four-foot burner of the common Coal Gas supplied to cities and towns. The comparative smallness of the flame greatly diminishes the heat, which is often found so oppressive in large rooms lighted with coal gas. The absence of the flickering which is often disadvantageous and disagreeable in common coal gas, is another quality which it can be made to possess. Until the recent adoption by the public of Coal and Petroleum Oil Lamps, Coal Gas was considered to be by far the cheapest illuminator known. Since the discovery of a process for manufacturing gas from Petroleum, to burn without smoke or smell from ordinary gas burners when properly made, Coal Gas has has been far surpassed in cheapness by Petroleum Gas, and a milder, steadier, yet stronger light secured.

Its cheapness may be inferred from the following brief statement:—

Five gallons of Crude Petroleum distilled and converted into gas according to our process, make one thousand cubic feet of gas. But one cubic foot of Petroleum Gas is equal in illuminating power to FOUR cubic feet of common Coal Gas, so that in effect five gallons of Petroleum are capable of producing an amount of light represented by 4,000 cubic feet of Coal Gas, or from $12 to $16 in money, according to the present ratio of gas charges in Canada. Where gas is required to be manufactured on a large scale, it is desirable to remember that petroleum and water are easily handled, and can by their own flow supply the retorts continuously and without waste, thus doing away with the unceasing labour of continually replenishing the retorts with coal, and the expense entailed in the maintenance of numerous hands.

With respect to public buildings, one man giving three hours' attention per day to the manufacture of Petroleum Gas, can produce by our patent process, enough gas to supply 100 burners with full pressure for 10 hours, at a cost of material not exceeding ONE DOLLAR, fuel for distillation included, or at from one-fourth to one-third the cost usually charged by the Gas Companies now existing in Canada.

The substitution of Petroleum for Coal in Gas Works now in operation, can be effected with very little additional expense.

In public and private buildings where it is desirable to introduce Petroleum Gas, a small detached room would be required, according to the capacity of the works. The pipes and burners now used by Gas Companies are in all respects adapted to the Petroleum Gas, with this difference, that where a FOUR foot burner (the one in common use) for Coal Gas is employed, a ONE-foot burner for Petroleum Gas would have to be substituted. Petroleum Gas burning through a FOUR foot gas burner is a magnificent illuminator, and one which would not often be used for ordinary purposes.

Any communications relative to the introduction of the Patented Petroleum Gas into public buildings or private houses, may now be addressed to JAMES E. THOMSON, 109, King-street, West, Toronto; and if the applicant state the number of burners required to be supplied, an estimate of the size and cost of the apparatus will be returned without delay.

We are, Sir, your obedient Servants,

JAS. E. THOMSON,
Hydraulic and Gas Engineer.

HENRY YOULE HIND, M. A.
Professor of Chemistry and Geology, Trinity College, Toronto.

This is speaking to facts certainly. Where coal is abundant and cheap, it is not probable that in towns or cities, gas manufactured from CANADIAN NATIVE OIL will be a successful competitor for public favour, notwithstanding its superior illuminating power, and the agreeable softness of the light which it produces. The manufacture of gas from coal has attained such excellence, that where the material can be procured at a moderate rate, the value of the coke and other by-products is sufficient to pay the

expense of manufacturing the gas *per se*. It is the pipes and the quarrelling, and the lawyers, and the Acts of Parliament, that have made gas dear, by loading it with the interest of a heavy unnecessary outlay. But in districts, where coal is dear, and for large buildings not within reach of gas works, this Canadian native oil will become the cheapest source of illumination. The gas from it, with which the cities of Toronto and Montreal are now lighted, affords, we are assured, satisfactory proof that it can be manufactured with the utmost ease to burn without smoke or smell, and to give a light three times as brilliant as ordinary coal gas. From a gallon of Canadian native oil in the crude state, weighing 8lbs., 6oz., Mr. Jas. Thomson produces 150 feet of gas of high illuminating power, with a soft agreeable light, and no smell or smoke. Is there not reason, then, to believe that the manufacture of gas from the Canadian native oil will become general in large establishments, in rural districts, and in towns where coal is dear, not in England only, but more particularly in France and many parts of Germany? In one town in Germany, we hear, that they manufacture gas from the fat which they extract from soap-suds, which have thus become an article of daily barter throughout the town. It is easy to conceive that the crude Canadian native oil, would find purchasers from the practisers of this ingenious and expensive process. "The expectations of those who believe that the petroleum trade, which they compare to that in gold, will amply make up for any deficiency that may be caused by the interruption of the trade in cotton, may, at first sight," says the "Cornhill Magazine," for June, "appear extravagant; but when we consider the vast consumption of gas in all the great cities and towns of Europe—from Lisbon to Moscow, in our Australian Colonies, in the cities of India, and reckon the gradual substitution of petroleum for coal in the manufacture of gas—the calculation will hardly be thought absurd."

Use of Canadian Native Oil as a Fuel.

The crude Canadian native oil is admirably adapted to form the means of utilising, for combustion, certain refuse matters, which, without admixture with tar or similar substances, are wholly valueless. The high price of fuel in France, and the many patents taken out for artificial fuel, point out a ready market. Clay in balls, as in Persia; sawdust and clay, as in Norway; refuse charcoal, as in France, with numerous other materials, may be impregnated with the crude oil, or the tar refuse, and converted into artificial fuel. It will be used also in stoves for cooking, in place of alcohol; or rather, it will take a position which alcohol has been too high-priced to occupy—that of supplying heat and fire to cooking-stoves. Nor is it im-

possible that our Ocean Steamers may seek its aid as fuel, for the rapid generation of steam, since to them economy in bulk and weight is a great desideratum. Petroleum is the essence of coal, and the question of its adoption, as a steam-generator, is dependent on the abundance and certainty of the supply. To the first, the "flowing wells," of Enniskillen have already given a satisfactory answer; to the second, a response is sought by the formation of a "CANADIAN NATIVE OIL COMPANY," in this country.

ITS ANTISEPTIC PROPERTIES.

Wood steeped in petroleum, or what is better, having Canadian native oil forced into its pores by pressure, is proof against decay for many years. The expense of Kyanizing, and the enormous cost of relaying the wooden trees and sleepers of railways, will then be materially reduced.

CANADIAN OIL AS A LUBRICATOR.

We have already spoken on this head. The crude oil is now sought after in many workshops where swift motion is employed; when mixed with fat or resin, it acquires greater consistency, and constitutes the well-known "Railway Grease," but it is the heavy lubricating oil, one of the results of destructive distillation of the crude product, that will be most extensively used. From this heavy lubricating oil, when not thus used, paraffine, from which candles are made, equal to Belmontine, can be extracted by the ordinary processes of cold and pressure.

BUSINESS PROSPECTS OF CANADIAN NATIVE OIL.

The Canadian Oil, as refined in this country and imported into France, will enjoy an advantage of 10 per cent. differential duty under the Cobden Treaty over that from the United States, an advantage it will possess over American oil in addition to the tax on local consumption, which invariably acts as an impediment to export, by weighting the immediate market for the article—as was evidenced in our own commercial history by the duties on paper and glass, which had limited, if not destroyed, our export of those manufactures to foreign ports.*

Paris, le 10 Décembre, 1861.

* MONSIEUR,—Vous m'avez fait l'honneur de m'écrire le 28 Octobre dernier, à l'effet d'être fixé sur le droit d'entrée applicable à l'huile de schiste purifiée.

Ce produit est assimilé à l'essence de houille qui est passible de la taxe de 5% de la valeur, quelque soit la mode de transport, à l'importation directe d'Angleterre ou de Belgique, lorsque l'origine anglaise ou belge en est dûment justifiée. Arrivant de tous autres pays, l'essence de houille est soumise au droit de 13f. ou de 14f., 30c. les 100 kil. plus le double décime, suivant qu'elle est importée sous pavillon français ou sous pavillon

"This oil," says the correspondent of the *Times*, "makes a better light when refined than any other burning fluid I have ever seen, second only to the best coal gas, with no liability to explode like many illuminating fluids that have been from time to time offered to the public." "An increase of purity," says the *Times* city article of February 25th, 1862, "is being constantly effected by the daily experience of its enlarged manufacture; but the question of price cannot be tested until the requisite facilities of transport shall have been established." An idea which the same journal (ever foremost in its knowledge of the commercial bearings of any important discovery) still further carries out in a city article of April 11th, as follows:—

"The last Canadian papers shew that the supplies from the oil-wells constitute an increasing topic of attention throughout the province. As the quantities are apparentiy illimitable, freight is the grand question for consideration, and the *Toronto Globe* points out that the real abundance of the article will not be manifested in Europe until special facilities for transport and shipment are brought into operation. In the instance of refined oil there are no particular difficulties; but the refining process can be carried on more economically and extensively on this side, and the object, therefore, is to contrive means for the cheap transport of the crude material. In that state its smell is so offensive, that grain, flour, or other articles carried in trucks or vessels in which it has previously been stowed, become damaged, and there is consequently a general indisposition to take it, except at very high rates. A class of tank-vessels will therefore probably have to be created for the purpose. 'A vessel,' it is observed, 'that carries one load of petroleum is fit for no other business, save coal, iron, timber, or other articles which cannot be spoilt by the odour.' Still, even at the high rates at present paid for both land and sea freights, it is calculated that the price is sufficient to yield a good profit to the owners of the flowing wells, who are at no expense for pumping. The values of the petroleum landed at Liverpool is about 1*s.* per gallon, and nearly the whole of this consists of the charges for transport; while the belief in Canada is that under an organized system these charges

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étranger et par terre. Il est, d'ailleurs, facultatif aux importeurs d'essence de houille Anglaise ou Belge d'adopter pour le droit au poids résultant du tarif général, quand l'application de ce droit leur paraît plus avantageuse que celle de la taxe à la valeur inscrite dans les tarifs conventionnels.

Agréez, Monsieur, l'assurance
de ma parfaite considération.
Le Conseiller d'Etat, Directeur Général.
BACKER.

TRANSLATION.

SIR,—You did me the honour to write to me on the 28th December last, so as to know the duty payable on purified schist oil. This produce is assimilated to the Essence of coal, which pays 5% ad valorem, by any mode of transport direct from Belgium or England, where the English or Belgium origin is duly certified. Coming from any other country, the Essence of Coal pays 13f. or 14f., 30c. the 100 kil., plus the double decime, according to its being brought in under the French flag or under a foreign one, or by land. It is, however, optional to the importer of the English or Belgian Coal to choose the duties by weight arising from the General Tarif, when it appears more advantageous than by the duties ad valorem.

might be reduced to 2½*d.* per gallon, or even lower. The room for an extension of the trade is therefore beyond calculation. At one of the flowing wells the oil rises from a depth of 234 feet at the rate of 25 barrels, or about 1,000 gallons per hour; much of it is allowed to run to waste from the inadequacy of the supply of barrels, and of the other means to store it. At another well the supply is alleged to have poured forth at the rate of 70,000 gallons a day, uninterruptedly, except when the opening is plugged, since the 16th of January last. A third well exists of a similar capacity; and the other wells, which require labour or machinery for pumping, are innumerable. The latter, however, at present prices, do not pay for working, since the proprietors of the flowing wells are of course ready to part with their produce at rates which are little more than nominal. The United States' wells in Pennsylvania are equally if not more extensive, and the quantities of oil seeking transport to New York and Boston are said to be far beyond the present carrying power of the Atlantic and Erie Railways. Under the circumstances the preparation of a sufficient rolling stock, and the completion of the short links which are to bring the districts into direct connexion respectively with these lines in the United States, and with the Great Western in Canada, will be awaited with general interest."

There is no doubt as to the amount of supply of the Canadian Oils for ages yet to come. The area of the "oil-fields" formation has been pronounced by the Government geologists, in their Report on Western Canada, to extend under 7,000 miles in the Canadian provinces. To control the astonishing abundance of the yield, and to keep it in store, not until a market can be found—for that has been accomplished—but until the means of reaching that market can be obtained, is the problem of the day. Capital has to be organised, refineries established, docks secured, ships purchased, a railway system perfected, before the great fact of the mutual enrichment of England and Western Canada, by dealing with the goods provided for them by Nature, can be brought about and perfected.

The European markets afford a great field. In England, France, and Germany, every promise of a mighty commercial success seems likely to be realised.

Much has already been done, and many sacrifices have been made; all that was required of them patiently endured by our brethren on the other side of the water; they have now by corduroy roads and a new railway branch,—not only projected but absolutely in course of construction, and to be finished in the course of the present summer,—brought the oil down to a port on the Lake St. Clair, which places their produce in connection with the Great Lake, River, and Canal communication of Canada, and enables it to be brought direct and in unbroken bulk from the extreme of Canada West to the Port of London, or any other port and harbour of the world. What is now required is, that the English capitalist should meet his Canadian brother on the shore with ships ready to receive his barrels, purchase from him the immense wealth he has drawn from the

teeming bosom of the earth, and, by means of science, extract from them, by refining, all those valuable and precious products for which the world's market is waiting.

These are not fancies or speculations, but actual facts,—a new California, to be worked by science and capital rather than by ignorant labour, is open to those who have sufficient acumen to appreciate it. It is as if some great Russian merchant were to declare his stores open to all who would come and fetch the tallow away from them. However we might question the sanity of the over-generous individual, all would know that the article had a marketable value, and would go for it accordingly. Just so, in the present instance, the stores of all-bountiful nature are exuding forth for us "liquid light,"—oil of excellent quality, of known commercial value, and of ready sale, as we have shown; producing by the addition of a trifling amount of skill to its manipulation an equivalent for turpentine,—just at a time that the internecine war in the United States has rendered that valuable article most scarce,—a solvent for India rubber and gutta percha, just as that article, in a newer condition only produced by solvents, is coming into use in a thousand new ways,—and the base of dyes so precious that the wonder of our International Exhibition is one piece of them, no larger than a pint pot, yet in value £3,000.

To sum up the uses and advantages of CANADIAN NATIVE OIL as a burning fluid, it may be pronounced to be incomparably the cheapest, as it is the brightest illuminator that has yet been manufactured, even with the existing disadvantages of an imperfect knowledge of its constituents and the dearness of requisite chemicals (sulphuric acid and alkalies) in the localities where it has hitherto been refined. When brought over to this country, where the highest chemical acumen has been culminated to the extraction of its commercial products, and the cheapest of all processes—the use of steam alone—has been applied to its refinement, there can be little question, that for domestic purposes it will drive all other means of illumination out of the field.

CONCLUSION.

The wider diffusion of information, respecting this new supply of light and fuel, the now general necessities of civilised man, its nature, and the extent to which it can be obtained from the Canadian native oil region about Enniskillin, is a matter of grave importance, not only in England but in France and Germany. We must be ready to show in practice that CANADIAN NATIVE OIL can do all that is promised for it. For this purpose, the International Exhibition affords a medium better than a thousand advertisements. Specimens of CANADIAN NATIVE OIL

in every stage can now be seen in the Canada Department, where any enquiry addressed to Sir William Logan, the head of the Commissioners, who is generally on the spot, and laudably anxious to impart every possible information that may tend to develop the industrial resources of that country, will meet with courteous attention and reply.

In order to show the comparative advantage of this Petroleum or Rock Oil over all other burning oils, the following statement, the result of careful experiment and calculation, is submitted:—

Description of Oil.	Price per Gallon.	Intensity of Light by the Photometer.	Amount of Light from equal quantity.	Cost of an equal quantity of Light in decimals.
Petroleum or Rock Oil .	2/.	13·70	2·60	2·00
Sperm . .	7/6	2·00	·95	20·00
Camphine .	5/.	5·00	1·30	10·00
Rape or Colza	4/.	2·10	1·50	6·50
Lard . .	4/.	1·50	·70	14·50
Whale . .	2/9	2·40	·85	8·25

The market is universal and boundless, in England, France, and Germany. Sir Roderick Murchison, in a recent address to the British Association, invited attention to "an important discovery of a resinous Shale in Tasmania termed Dysodile, which, like the Torbane Mineral of Scotland, promises to be turned to great account in the production of paraffine." But here is "the paraffine ready found and associated with more illuminating oils, and other substances in our Canadian petroleum, which shows only two parts of waste in every hundred parts." The markets of the world demand it, and the English capitalist has little more to do than send over his ships to fetch it, at his own price.

A flood of wealth is poured by nature into the lap of Canada—a flood, even in its crude condition, known to be worth millions. Our brethren, being of themselves incapable of realising the advantages of these new treasures to their full extent, invite us to aid them, and to share with them the yet greater profits to arise from Canadian Native Oil, its manufacture, transportation, refinement, and final sale. It is for Englishmen to say whether they will ignorantly surrender to foreign hands so great a commercial advantage.

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